October 21, 1935

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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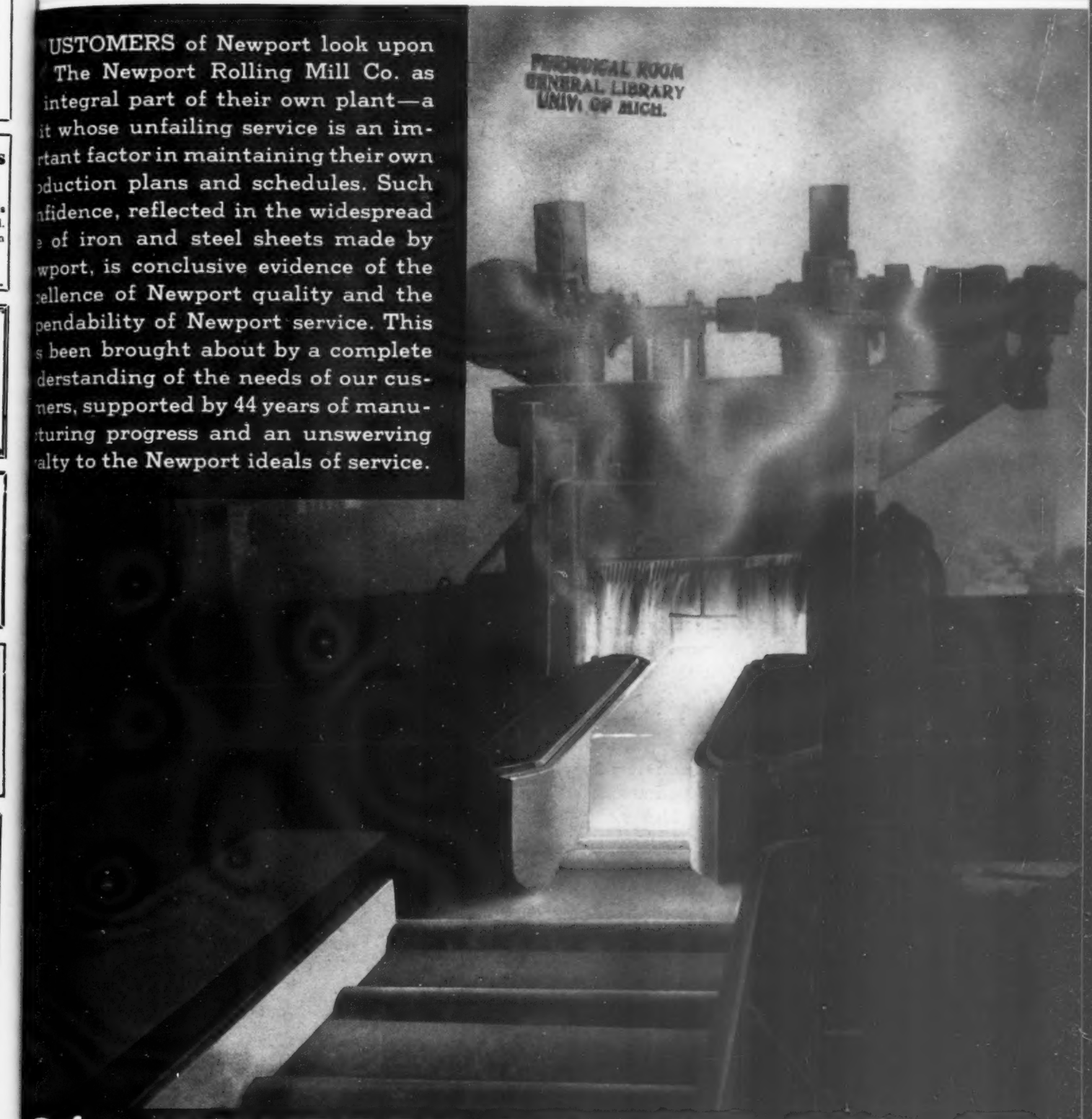

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CORPORATION

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ALLOY STEEL DIVISION · · · MASSILLON, OHIO

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This being the case, it would seem that it is industry's move to promote the use of steel in dwellings more aggressively and more effectively than it has in the past. One of the troubles is that eight or ten branches of the metalworking industry have stakes in the prospective market, and as yet they have not been able to organize effectively to co-ordinate their efforts. Some one unit of industry should take the initiative in setting up this urgently needed organization. Which shall do it? The steel construction industry, the metal lath industry, the sheet and strip producers, the sheet and strip fabricators, or the house equipment manufacturers? The parent steel industry has much at stake. Should it start the ball rolling?

E. L. Shaner

Constructors Lift Unit Stress, Discuss Bid Depositary, For Self-Governing Industry

NEARLY 200 members and guests of the American Institute of Steel Construction Inc. met at White Sulphur Springs, W. Va., last week for the thirteenth and perhaps the most important annual convention of that organization.

From start to finish, in the three-day program beginning Wednesday, the uppermost topic of discussion was the problem of administering effectively the Institute's recently adopted plan for a bid depositary, cost studies and statistical reports.

Speaker after speaker was unanimous in the opinion that the job of keeping industry's house in order rests with industry itself, with the co-operation of the government.

Purchasers Will Benefit

An important action of the Institute was the approval by the board of directors of the recommendation of the committee on specifications, presented by F. T. Llewellyn, of the United States Steel Corp., New York, that the industry increase the allowable basic unit stress from 18,000 pounds to 20,000 pounds per square inch. This action will benefit all buyers of structural steel and substantially reduce the cost of steel construction.

New directors elected were: T. A. Straub, Fort Pitt Bridge Works, Pittsburgh; George Harris, Harris Structural Steel Co., New York; and J. H. Brillhart, Fort Worth Structural Steel Co., Fort Worth, Tex.

Directors re-elected were: H. B. Hirsh, Belmont Iron Works, Philadelphia; R. P. Hutchinson, Bethlehem Fabricators Inc., Bethlehem, Pa.; H. A. Fitch, Kansas City Structural Steel Co., Kansas City, Kans.; G. H. Blakley, McClintic-Marshall Corp., Bethlehem, Pa.; Charles N. Fitts, New England & Structural Steel Co., Everett, Mass.; and A. J. Post, Post & McCord Inc., New York.

The next meeting will be held in White Sulphur Springs, Oct. 21-23, 1936.

In his report as secretary of the institute, V. G. Iden emphasized the importance of the function of public relations. "It is our province not merely to interpret our industry to our public," he said, "but to interpret our public to our industry. That is what is meant by enlightened self-interest."

Mr. Iden pointed to two ways in which "the Washington picture is inconsistent with the facts as we know them to exist." He referred to the government estimates to the effect that 10,000,000 persons are unemployed, but pointed out that the relief administration states that only 3,500,000 of those persons are actually employable. "The billions of dollars of taxpayers' money spent on relief," he contended, "is primarily for those who could not work if the opportunity were theirs. They constitute the great mass of people we formerly cared for through private charity, and through local organizations. When speaking of the volume of unemployment it is not accurate to include them. The unemployment problem is quite different from what Washington cares to picture it."

Again Mr. Iden charged that Washington paints an inaccurate picture when it reports that construction is increasing. "Real construction is not," he said, "but boondoggling is. The volume of fabricated structural steel shipped this year is about 10 per cent less than the volume we sold in 1934. The volume of other building materials going into construction this year also is less. If there is more money being spent this year on construction, it is not being used to buy materials for construction."

Solving Competitive Evils

C. G. Conley, president, Mt. Vernon Bridge Co., Mt. Vernon, O., and president of the institute, in presenting the president's annual address, touched upon many phases of the problem of competition in the steel construction industry. He outlined the institute's attempt in 1931 to seek a solution to competitive evils through the establishment of a plan for the automatic allocation of work. "But in 1931," he said, "the country was not ready for the social reforms which today we take for granted. We were restrained from adopting the White Sulphur plan."

Then Mr. Conley touched briefly on the institute's experience in code writing and code negotiation under NRA. "The failure of NRA," he declared, "constituted no indictment of trade associations. It constituted no indictment of our code negotiations. As a matter of fact, I can conceive of the demise of NRA as a vindication of our tactics and of the reasonableness of our demands."

"NRA was not administered to aid management, but rather to make labor more secure. If NRA is to be revived on the ashes of the Schechter decision, we should not forget what happened during the past two years, must not forget that business executives are not politicians. We have not been looking for votes but for relief. We have not pleaded for social security, but rather for industrial security.

"If we are to be denied the aid we require through political action then we must seek it of our own action, voluntarily and naturally. That is our only hope. . . . .

"It is not adequate that a man be *kept* upright. A man should *be* upright. If we are to muddle our way out of this depression the duty is distinctly yours. We can offer you a cause for action, a staff to head up your co-operative endeavors. There is no power in us to make of you something that you are not."

Outlines New Statistical Work

Mr. Conley then spoke briefly of the plan for a bid depositary, cost studies and statistical reports recently adopted by the institute. Robert T. Brooks, former president, George A. Just Co., New York, will have charge of the new work and Thomas H. Hendrix, office manager of the institute, has been appointed director of statistics.

President Conley announced that during the year four district engineers had been added to the field staff. They are E. N. Adams, stationed at Worcester, Mass.; C. R. Bloxton, with headquarters at Atlanta, Ga.; Robert J. Wood, at St. Louis; and L. H. Dodd, Dallas, Tex. The institute now has nine district field engineers, the others being B. F. Hastings, Upper Darby, Pa.; Alexander Miller, Cleveland; Henry Penn, Chicago; Jack Singleton, Topeka, Kans.; and W. E. Emmett, San Francisco. In addition, F. H. Frankland, technical director of the institute, handles the New York metropolitan area and Washington.

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R. B. Thomas, attorney, New York, discussed "Possibilities from Co-operation." He outlined the objectives of the Clayton and Sherman acts and explained that the interpretation of these laws must come in large measure from the decisions of the courts in cases involving them.

He went into detail to show that the legal aspects of alleged price fixing is different in the case of the steel construction industry than in industries where products are made in quantities prior to actual sales. Steel fabrication and erection is a "bidding business," he contended, and there is no such thing as a market price for a fabricated structure.

Price Exchange Within Law

Mr. Thomas also pointed out that the collection and interchange of price information on past or completed jobs is entirely within the law. He quoted extensively from various court decisions to clarify certain points as to what can or cannot be done by companies within an industry to combat the evils of ruthless competition.

Alexander Wall, Robert Morris Associates, Lansdowne, Pa., discussing "What's Going On," declared the nation is going through an industrial renaissance.

"We can't go back to industrial czarism," he said. "We cannot continue to run counter to natural laws of economics. If I were a business man I would not wait for any more blue eagles or pink elephants, but would urge my industry to solve its problems by its own devices."

Mr. Wall discussed the financial statements of steel construction companies and urged executives to compare individual statements with common-size financial statement of the entire industry.

At the annual banquet Thursday the principal speaker was James A. Emery, general counsel, National Association of Manufacturers, who discussed implications of social security legislation of the present administration and emphasized the duty of industry to solve competitive problems independent of government influence.

Mr. Emery declared the function of the government should not be that of a bullyragging traffic cop, bawling out motorists on the highway of commerce, but rather an efficient traffic officer intelligently helping to guide motorists into the right street.

Mr. Emery's address was seen as an acceptance of the invitation of Secretary of Commerce Roper that "business work out for itself the degree and kind of help which it needs from the government."

This invitation contrasts sharply with the views of NRA Co-ordinator Berry, generally believed to be laying the groundwork for a revival of NRA, but which was denied by him in Washington Friday (p. 21).

"All our conceptions of government," Mr. Emery concluded, "all our ideas of rational freedom, suggest not merely the use, but the encouragement, of voluntary co-operation through legitimate trade associations in the preservation of the competitive system and the elimination of abuses to the very limits of voluntary action with a minimum of compulsion and a frank recognition of the fact that the function of government is to serve and not to subject."

Albert C. Shire, chief engineer, technical division of FHA, Washington, spoke on "Opportunities for Steel in Dwelling Construction." He pictured a pending housing shortage, declaring that there were more marriages recorded in 1934 than in 1929. He said that 7,000,000 new homes will be required in the next ten years, with no allowance for replacements. Counting replacements, the total will be 14,000,000 new dwelling units in the next decade.

Mr. Shire stated that steel is an ideal material for home construction, particularly for the frame. He discussed several types of steel-frame houses which have been developed and erected in this country.

Assuming that steel framing were used in 10,000,000 of the homes to be built in the next 10 years, at 4 tons per unit, the consumption of steel would be 40,000,000 tons or 4,000,000 tons a year. Figuring conservatively, on the basis that steel were used in only one out of every four of these houses, the requirements still would amount to 10,000,000 tons, or 1,000,000 per year. Mr. Shire urged the steel industry to go after this tonnage aggressively.

Co-operative Action Urged

Steel for houses also was discussed at length in the report of the institute's committee on "Extended Uses for Steel," which was presented by A. J. Dyer, Nashville Bridge Co., Nashville, Tenn. The committee recommended continued attention to the possibilities of steel in house construction, and reported on suggestions emanating from other organizations for co-operative action between interested industries for promoting steel in houses more effectively.

A. J. Post, Post & McCord Inc., New York, presented the report of the committee on uniform contracts for steel. The committee proposed standard contract forms for erected work and for work furnished and delivered.

In reporting technical activities of

When Westinghouse Held Open House

MORE than 35,000 people visited the Westinghouse Electric & Mfg. Co. works in East Pittsburgh, Pa., during the recent "family day" celebration. For the entire day the plant was on an open house basis for inspection by families of employes, their guests, and the general public. Included in the program were tours through works, exhibitions of products of general interest, demonstrations of artificial lightning, research phenomena, and other engineering and industrial achievements which may be viewed only in the largest of industrial organizations. Visitors saw modern production lines, huge machinery used in fabricating large equipment, accurate and sensitive devices for balancing rotors to within one-thousandth of an ounce, and machine tools to pare down metal within limits of one-ten-thousandth of an inch. In the production aisles were motors and control for operating new steel mills for the Bethlehem Steel Co. and the Laclede Steel Co.

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Don't let inertia encumber your business

BUSINESS philosophy associates "inertia" with the ever-debatable policy of "Let well enough alone." Too often this inertia is the result of a groundless fear of upsetting routine, changing specifications and inspection standards, resetting machines, recasting work sheets, ironing out new processing kinks . . . temporarily slowing up production.

Nevertheless, executive and sales heads ever have before them the vital problems of competition and consumer preference. They see clearly the dangers of inertia. But they are not always technicians. Hence, they must look to you — metallurgist, engineer, production expert — to share the responsibility for Progress in raw material and product.

Steel — together with iron, is the basic raw material of American business. Admirable as are many of the more familiar alloying elements for giving steel this or that added quality, inertia threatens when executive, engineer and production manager are "entirely satisfied" and content to ignore the metallurgical progress still being made in alloyed steels. In fact, the past ten years have witnessed some of the greatest of all advances . . . with Molybdenum steels probably outranking all others.

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To engineers, metallurgists and production executives we offer these interesting books: "Molybdenum in 1934" and "Molybdenum in Cast Iron — 1934 Supplement." Also ask us to mail you our periodical news-sheet, "The Moly Matrix." Be free, too, to enlist our Detroit experimental laboratory's help at any time. Climax Molybdenum Co., 500 Fifth Ave., New York.

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tunities for Steel," E. L. Shaner, editor of STEEL, Cleveland, emphasized the indispensability of steel in comparison with other basic materials. This address was received enthusiastically by institute members and will be presented in full in next week's issue of STEEL.

R. B. Thomas, attorney, New York, discussed "Possibilities from Co-operation." He outlined the objectives of the Clayton and Sherman acts and explained that the interpretation of these laws must come in large measure from the decisions of the courts in cases involving them.

He went into detail to show that the legal aspects of alleged price fixing is different in the case of the steel construction industry than in industries where products are made in quantities prior to actual sales. Steel fabrication and erection is a "bidding business," he contended, and there is no such thing as a market price for a fabricated structure.

Price Exchange Within Law

Mr. Thomas also pointed out that the collection and interchange of price information on past or completed jobs is entirely within the law. He quoted extensively from various court decisions to clarify certain points as to what can or cannot be done by companies within an industry to combat the evils of ruthless competition.

Alexander Wall, Robert Morris Associates, Lansdowne, Pa., discussing "What's Going On," declared the nation is going through an industrial renaissance.

"We can't go back to industrial czarism," he said. "We cannot continue to run counter to natural laws of economics. If I were a business man I would not wait for any more blue eagles or pink elephants, but would urge my industry to solve its problems by its own devices."

Mr. Wall discussed the financial statements of steel construction companies and urged executives to compare individual statements with common-size financial statement of the entire industry.

At the annual banquet Thursday the principal speaker was James A. Emery, general counsel, National Association of Manufacturers, who discussed implications of social security legislation of the present administration and emphasized the duty of industry to solve competitive problems independent of government influence.

Mr. Emery declared the function of the government should not be that of a bullyragging traffic cop, bawling out motorists on the highway of commerce, but rather an efficient traffic officer intelligently helping to guide motorists into the right street.

Mr. Emery's address was seen as an acceptance of the invitation of Secretary of Commerce Roper that "business work out for itself the degree and kind of help which it needs from the government."

This invitation contrasts sharply with the views of NRA Co-ordinator Berry, generally believed to be laying the groundwork for a revival of NRA, but which was denied by him in Washington Friday (p. 21).

"All our conceptions of government," Mr. Emery concluded, "all our ideas of rational freedom, suggest not merely the use, but the encouragement, of voluntary co-operation through legitimate trade associations in the preservation of the competitive system and the elimination of abuses to the very limits of voluntary action with a minimum of compulsion and a frank recognition of the fact that the function of government is to serve and not to subject."

Albert C. Shire, chief engineer, technical division of FHA, Washington, spoke on "Opportunities for Steel in Dwelling Construction." He pictured a pending housing shortage, declaring that there were more marriages recorded in 1934 than in 1929. He said that 7,000,000 new homes will be required in the next ten years, with no allowance for replacements. Counting replacements, the total will be 14,000,000 new dwelling units in the next decade.

Mr. Shire stated that steel is an ideal material for home construction, particularly for the frame. He discussed several types of steel-frame houses which have been developed and erected in this country.

Assuming that steel framing were used in 10,000,000 of the homes to be built in the next 10 years, at 4 tons per unit, the consumption of steel would be 40,000,000 tons or 4,000,000 tons a year. Figuring conservatively, on the basis that steel were used in only one out of every four of these houses, the requirements still would amount to 10,000,000 tons, or 1,000,000 per year. Mr. Shire urged the steel industry to go after this tonnage aggressively.

Co-operative Action Urged

Steel for houses also was discussed at length in the report of the institute's committee on "Extended Uses for Steel," which was presented by A. J. Dyer, Nashville Bridge Co., Nashville, Tenn. The committee recommended continued attention to the possibilities of steel in house construction, and reported on suggestions emanating from other organizations for co-operative action between interested industries for promoting steel in houses more effectively.

A. J. Post, Post & McCord Inc., New York, presented the report of the committee on uniform contracts for steel. The committee proposed standard contract forms for erected work and for work furnished and delivered.

In reporting technical activities of

When Westinghouse Held Open House

MORE than 35,000 people visited the Westinghouse Electric & Mfg. Co. works in East Pittsburgh, Pa., during the recent "family day" celebration. For the entire day the plant was on an open house basis for inspection by families of employes, their guests, and the general public. Included in the program were tours through works, exhibitions of products of general interest, demonstrations of artificial lightning, research phenomena, and other engineering and industrial achievements which may be viewed only in the largest of industrial organizations. Visitors saw modern production lines, huge machinery used in fabricating large equipment, accurate and sensitive devices for balancing rotors to within one-thousandth of an ounce, and machine tools to pare down metal within limits of one-ten-thousandth of an inch. In the production aisles were motors and control for operating new steel mills for the Bethlehem Steel Co. and the Laclede Steel Co.

the institute, F. H. Frankland, technical director, stated the addition of field engineers, referred to previously, was necessitated by increased inquiry from private buyers of structural steel and current activity in federal projects, such as grade crossing elimination. Calls from engineers, architects and constructors upon the institute's engineering service, he said, have increased very markedly during the past few months.

Mr. Frankland emphasized the importance of the institute's technical activities, saying "for every dollar spent in this direction, the industry will receive tremendous dividends."

Steel Is Suitable Material for Dams

THE possibility that structural steel and steel plates can be used advantageously in the construction of steel dams was emphasized in an address by Dr. Otis E. Hovey, consulting engineer, New York. Dr. Hovey pointed to the fact that the Ash Fork steel dam in Arizona, now is 37 years old and is reported to be in excellent condition in 1935. The Redridge steel dam in Michigan, built in 1900, still is in good condition although it has not been painted for 22 years. Skaguay, steel-faced rock-filled dam in Colorado, built in 1901, is in excellent condition and an officer of the power company which owns the structure estimates that it will last at least four times the elapsed time since its construction which is 34 years.

Dr. Hovey enumerated many reasons why steel is a suitable material for fixed dams. He also touched on the importance of sound foundations and adequate water seals. He also presented comparative figures on the cost of a concrete and steel dam 160 feet long with a maximum height of 54 feet. A concrete dam of these dimensions was built across the Saranac river in 1913. It was estimated that under the conditions obtaining in 1935, the dam could be built of steel for an amount which is 71 per cent of the cost of the concrete dam.

Advocates Further Studies

Dr. Hovey referred on several occasions to the success of sheet steel piling in connection wtih dam construction.

His conclusions are as follows:

The use of steel plates on the faces of rocks and other fill dams is increasing and has been justified by experience on several large dams. This type of steelwork is desirable for a well equipped structural shop and its installation presents no real difficulties to a competent field organization. Where a large dam is to be built, the structural steel tonnage becomes a considerable item which most fabricating companies would welcome on their order books. Further studies should be made of this type of construction and its adoption advocated in suitable locations with a view to increasing the application of a good and economical type of steel construction.

Steel frame dams have been to-

(*Please turn to Page* 60)

25 Companies in Metalworking Field Are Given 1935 Awards for Safety

TWENTY-FIVE companies were awarded plaques for winning first-place positions in the safety contest conducted in the metals section of the National Safety council during the past year, it was announced at council's twenty-fourth annual safety congress held in Louisville, Ky., last week, Oct. 14-18. The names of many well-known companies in the iron and steel industry appear in the list of prize winners.

Entered in the contest, which embraced the period from July 1, 1934, to June 30, 1935, were 194 units with 219,830 employes who worked 425,051,091 man-hours. The average frequency rate was 8.354, which represents a decrease of 19 per cent from the rate of the 1934 contest. This year, 104 units ended with a frequency rate below the average, and 12 per cent of these completing the contest finished with perfect records.

Leaders in Various Divisions

The following companies were winners of first-place plaques. The numbers of man-hours worked during the year, and the number of lost-time injuries are set after the name of each company:

Steel Mills Division, Group A

Corrigan, McKinney Steel Co., Cleveland; 6,566,016 hours, 10 injuries.

Steel Mills Division, Groups B and C

Three tied for first place—Youngstown Sheet & Tube Co., South Chicago, Ill.; 929,672 hours, no injuries. Great Lakes Steel Corp., Hanna Furnace division, Ecorse, Mich.; 783,302 hours, no injuries. Youngstown Sheet & Tube Co., Hubbard Furnaces, Youngstown, O.; 104,325 hours, no injuries.

Rolling, Finishing and Fabricating Division, Group A

Aluminum Co. of Canada Ltd., Toronto, Ont.; 1,236,706 hours, 2 injuries.

Rolling, Finishing and Fabricating Division, Group B

Eight tied for first place—Revere Copper & Brass Inc., Baltimore division, Baltimore; 900,413 hours, no injuries. Youngstown Sheet & Tube Co., Evanston, Ill.; 536,856 hours, no injuries. Republic Steel Corp., Grand Crossing, Ill.; 334,969 hours, no injuries. Lehigh Structural Steel Co., Allentown, Pa.; 279,050 hours, no injuries. Steel & Tubes Inc., Brooklyn, N. Y.; 251,847 hours, no injuries. Chapman Price Steel Co., Indianapolis; 225,116 hours, no injuries. Laclede Tube Co., Alton, Ill.; 139,917 hours, no injuries. Republic Steel Corp., Unionville, Conn.; 126,936 hours, no injuries.

Foundries Division

Four tied for first place—Mackintosh-Hemphill Co., Midland, Pa.; 339,385 hours, no injuries. American Rolling Mill Co., Central works, Middletown, O.; 181,809 hours, no injuries. Ideal Foundry & Machine Co., Youngstown, O.; 153,577 hours, no injuries. American Rolling Mill Co., Sixth Street Foundry, Ashland, Ky.; 104,022 hours, no injuries.

Heavy Machine Shops Division, Group A

United Shoe Machinery Corp., Beverly, Mass.; 6,246,912 hours, 3 injuries.

Heavy Machine Shops Division, Group B

Five tied for first place—United States Rubber Products Inc., Shoe Hardware division, Waterbury, Conn.; 808,123 hours, no injuries C. Hager & Sons Hinge Mfg. Co., St. Louis; 570,669 hours, no injuries. D & B Pump & Supply Co., Los Angeles; 180,587 hours, no injuries. Noera Mfg. Co., Waterbury, Conn.; 163,485 hours, no injuries. Pittsburgh Steel Co., National Steel Fabric division, Monessen, Pa.; 125,390 hours, no injuries.

Light Machine Shops Division

Two tied for first place—Benjamin Electric Mfg. Co., Des Plaines, Ill.; 807,091 hours, no injuries. Boston Gear Works Inc., North Quincy, Mass.; 634,820 hours, no injuries.

Dr. C. H. Watson, medical director, American Telephone & Telegraph Co., New York, was elected president of the National Safety council for the coming year. He succeeds John E. Long, superintendent of safety, Delaware & Hudson railroad, Albany, N. Y.

A report of technical activities of the National Safety congress appears on page 49 of this issue of STEEL.

Action on Embargo on Metals To Italy Awaits League

WASHINGTON

STATE department officials whose job it is to handle the neutrality situation are watching closely for the final action of the League of Nations in connection with the recommendations of a subcommittee last week that steel, iron, manganese ore, and other raw materials be placed on an embargo list against Italy as a part of the sanctions.

Considerable pressure still is being brought to bear on the state department that America follow this embargo list, if it is finally adopted, and while some state department experts feel that the President will not put these raw materials on the embargo list, there is considerable difference of opinion on the point—especially in view of the fact that if all League members embargo such commodities and the United States does not, the action of the League will be practically nullified.

There also is the sentiment at the state department that even if these raw materials are not embargoed by the President, large producers might get together and themselves enforce a ban without official action.

League Sets Up Three Lists

The official word received here from Geneva was to the effect that three lists were prepared by a subcommittee. List No. 1 contained manganese ore, chromium, tin, tungsten, molybdenum, and radium; list No. 2 contained steel, aluminum, bauxite, nickel, and zinc; list No. 3 included nitric acid, nitrates, and rubber.

Information is that steel was placed on the second list because Germany, a nonmember of the League, is an important producer and exporter of that commodity. However, it was felt that since the League powers control the production and marketing of iron, the stoppage of steel exports to Italy may be feasible.

The three lists were supposed to have been drawn up so that on the first list would be commodities controlled by the League members, the second of products partly controlled, and the third of products over which the League has doubtful influence.

The report received here stated also that Maxim Litvinoff, soviet foreign commissar, suggested a fourth list including the sale of machine tools, automobiles, and ships. This list was held in abeyance.

The proposed lists have to go through considerable red tape before they can possibly become effective. The subcommittee reports to a so-called "small committee," which in turn reports to a large committee, and this latter in turn reports to the assembly of the League.

There is a very definite report here that there are two distinct points of view at Geneva in regard to any embargo. On the one side are those who want a small embargo list to be active at once, while the other side believes that there should be a large embargo list and that it should be thoroughly gone into before made operative.

Secretary of Commerce Roper, who is a member of the munitions control committee, at his press conference last week stated that in his opinion the committee had not gone far enough into the study of raw materials, including steel and scrap, to give him any idea as to whether these commodities should be added to our embargo list.

Asked directly if he thought that these commodities should be added, the secretary stated that "we have not advanced far enough in our studies to answer that question at the present time." He said, however, that the munition control officials are making a thorough study of the whole question.

Both Secretary Roper and Secretary of State Hull have warned American business that while they are not prohibited from doing business with either Ethiopia or Italy, that they cannot expect any help from the American government if they get into trouble due to the war.

Secretary Hull recently said:

"Technically, of course, there is no legal prohibition—apart from the proclamation governing the export of arms—against our people entering into transactions with the belligerents or either of them.

"The warning given by the President in his proclamation * * * and his general warning that during the war any of our people who voluntarily engage in transactions of any character with either of the belligerents do so at their own risk were based upon the policy and purpose of keeping this country out of war—keeping it from being drawn into war. It certainly was not intended to encourage transactions with the belligerents."

Expect Small Effect From League Stand

NEW YORK

SELLERS of ferromanganese, manganese ore, iron, chromium, molybdenum, and other products selected by a League of Nations subcommittee for embargo to Italy agree that while such restrictions will undoubtedly prove hard on Italy, if finally adopted, the action should have little effect on world markets. Never-

Steel Is a Pliant Material

This tear-drop steel body was designed by A. J. Mummert, vice president and director of the McQuay-Norris Mfg. Co., St. Louis, to test engine performance. Speed of 100 miles and increased gas mileage are claimed. Wide World photo

theless, the possibility that the United States government may follow with a similar embargo is being considered with interest.

The proposed embargo list of the League subcommittee also includes tungsten, aluminum, nickel, radium, and tin, and so far as can be learned few shipments of any of these materials have left for Italy to date.

The principal ferrous item to have been shipped from this country to Italy has been scrap, and trade leaders in this commodity look for no governmental restrictions before the next session of congress, if then; if scrap were to be declared contraband, cotton logically should also, and it is believed that cotton growers would put up a tremendous fight in an effort to stave off such action.

For the present at least, scrap shipments to Italy have practically ceased, due to credit complications, difficulty in obtaining bottoms and advancing ocean transportation costs.

See Italy Still Big Scrap Buyer

NOTWITHSTANDING the barriers Washington, and presumably also the League of Nations, are raising to trade with Italy as the aggressor against Ethiopia, the iron and steel scrap trade expects Italy to be a substantial buyer of scrap for many years.

Richard V. Bonono, president of the New Jersey chapter of the Institute of Scrap Iron and Steel Inc., said last Monday:

"After a peaceful settlement of the Ethiopian situation, which is expected shortly, a gigantic industrial program for the electrification of railroads, building of roads and structures, intensive colonization, etc., will require large quantities of raw materials.

"In view of the fact that Italy is no longer buying any finished steel, but has increased its steel capacity to produce its own steel, substantial tonnages of scrap iron and other raw materials will be required for the industrial program for many years, and it is likely that Italy will be one of the best foreign customers of the United States."

The American Scrap Exporters conference, 11 West Forty-second street, New York has begun the issuance of a house organ called *The Scrap Exporter* in which it discusses war markets and lists an Italian inquiry for heavy melting steel and wrought iron scrap.

Mesta Exhibit Wins Prize

Mesta Machine Co., West Homestead, Pa., was awarded the prize for the most attractive exhibit at the Purchasing Agents' of Pittsburgh industrial exhibit held at the William Penn hotel, Pittsburgh, Oct. 10-11.

American Rolling Mill Co., Middletown, O., received a trophy for the most informative display.

Production

DECLINES in the Pittsburgh, Chicago and Buffalo districts tended to put the steelworks operating rate down another point last week to 51 per cent, and more than offset increases at Youngstown, eastern Pennsylvania, Cleveland and Birmingham. Other districts held steady. Despite the fact the rate has been sliding back the past two weeks, it still compares favorably with the rate of a year ago, which was only 26½ per cent. Details follow:

Chicago—Declined 3 more points to 55 per cent, extending the drop for the past two weeks to 5 points below the peak of the last seven months. At least part of this loss is expected to be recovered this week. Lighting of a blast furnace at South Chicago brings the number of active steelworks stacks to 15 out of 36, the highest rate of the past several years. A further increase is not unlikely next month, due to heavy demand for pig iron.

Pittsburgh—Down 2 points to 46 per cent last week, due to failure of the leading interest to close the week at better than 40 per cent. The leading independent continues to operate at 55 per cent, with rates of the smaller independents averaging 50-55 per cent.

Twenty-six out of 60 steelworks blast furnaces are now on, a gain of one over a week ago. Carnegie-Illinois Steel Corp. blew in a third Duquesne furnace Oct. 18, with the possibility of two more being blown in, one at Clairton and one at Edgar Thomson. Carnegie-Illinois Steel Corp. is operating 11 of 32, Jones & Laughlin Steel Corp. 8 of 11, Bethlehem Steel Co. at Johnstown 3 of 7, and American Steel & Wire Co., National Tube Co., Pittsburgh Steel Co., and Pittsburgh Crucible Steel Co., one each.

Youngstown—Up 2 points to 58 per cent last week and tentative schedules indicate a rate of 60 per cent or slightly more. Republic Steel Corp. added an open hearth at its Lansingville plant. Forty-nine out of 83 open-hearth furnaces are making steel in this district.

Detroit—Unchanged at 88 per cent last week. One producer has placed an open-hearth furnace back in activity after being down for repairs two weeks ago, but the other producer has dropped to 7 out of 9.

Wheeling—Steady at 81 per cent. In the four district plants, 30 out of 37 open-hearth furnaces continue to operate.

Cleveland-Lorain—Up 3 points to 62 per cent. Corrigan-McKinney division of Republic Steel Corp. lighted its seventh open hearth in midweek, and later in the week its eighth unit. Otis Steel Co. increased from seven to eight, but dropped back to seven. National Tube Co., Lorain, continued with ten active.

Central eastern seaboard—Advanced 1 point to 38 per cent, with an increase of three units at Steelton, Pa., and a gain of one at Coatesville, Pa., contributing to the improvement. The tendency is still upward, with miscellaneous demand for finished steel broadening slowly.

New England—Unchanged at 68 per cent last week, with indications this rate will be held for this week.

Buffalo—Off 2 points to 50 per cent, due to enforced withdrawal of one open hearth from the active list. A breakdown forced this change. It is expected that 20 open hearths will again operate this week, representing a rate of 52 per cent.

Birmingham—Up 3 points to 58½ per cent last week, owing to heavier schedules. The Fairfield furnaces continue to supply steel for rail rolling.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

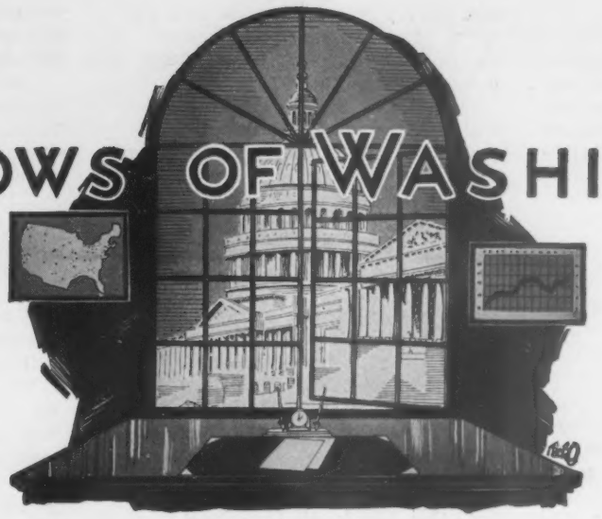
	Week ended Oct. 19	Change	Same week 1934	Same week 1933
Pittsburgh	46	− 2	20	35
Chicago	55	− 3	27	45
Eastern Pa.	38	+ 1	19½	23½
Youngstown	58	+ 2	30	57
Wheeling	81	None	23	47
Cleveland	62	+ 3	31	33
Buffalo	50	− 2	24	24
Birmingham	58½	+ 3	25	30
New England	68	None	40	82
Detroit	88	None	59	55
Average	51	− 1	26½	34

Transportation

FREIGHT car requirements for 29 principal commodities in the fourth quarter are estimated by regional shippers' advisory boards to total 4,805,388. This is an increase of 6.4 per cent over the actual loading of 4,515,835 cars in the fourth quarter of 1934.

For iron and steel, estimated car requirements this quarter are 234,963, or 22.3 per cent above the actual loading of 192,189 cars a year ago. Expected increase in coal and coke is 3.9 per cent, ore and concentrates 13, machinery and boilers 14.4, automobile 108.6, and farm implements 36.3.

WINDOWS OF WASHINGTON



WASHINGTON

MAJOR GEORGE L. BERRY, adviser for industrial co-operation, has decided to have a combination industry-labor conference in Washington, probably sometime early in November. The exact date will be announced early this week.

It was stated in these columns last week that Major Berry intended to call such a conference no matter what the answers were to the 5200 letters sent out, but he claims that some 700 answers have now been received and that most of these favor such a conference.

However, some who are opposed to the conference and who make no bones of it are saying that Major Berry is calling the conference to get some personal publicity. Others say that if industry prefers to go its own way NRA can say to congress that industry refuses to co-operate with the government, and should be shackled again.

Incidentally, while on the subject of NRA and its future, Major Berry has taken the trouble to deny emphatically the persistent rumor of last week that he ever said that he intended to stop the industry studies being made by NRA.

Now Roper vs. Berry?

He says that he never even thought of such a thing, although a member of a large industry in Washington last week made the direct charge that Major Berry had said this to him personally. However, the Major may have thought better of it in view of the fact that the studies were originated under executive order. Even he has not yet taken to nullifying executive orders.

Speaking on the matter of the proposed industrial conference, Secretary of Commerce Roper last week stated that "business has to take back some of the business responsibilities." In making this remark he denied that he was taking issue with Major Berry. He said that it is up to business to say to what extent, if any, government shall take a hand in controlling business activities.

Secretary Roper said that in his opinion the conference methods adopted under the NRA were helpful in many ways, and that he believes a large percentage of business is favorable to the fundamentals of the NRA program. Mr. Roper said that he feels that the government prefers to decentralize all of the responsibilities of the business situation where business can handle the situation itself.

Control, Not Regimentation

No important government department, the Secreatry maintained, wants to regiment or meddle with business—but it does need certain control. In amplifying this statement, Mr. Roper explained that he referred to the Sherman law and regulations for child labor, hours, and wages. The question is, he said, is how to effectively work out these controls.

Major Berry in a statement last week insisted that there is a strong business sentiment for the preservation of NRA standards. He claims to have reached this decision as the result of the answers he has received to his recent letter.

However, there are those at NRA, who are in closest touch with the situation, who state that this has always been the major's preconceived idea and that he could not possibly have got it from the answers received.

There is a very decided feeling at NRA that the favorable answers from the business and industrial interests of the country to the letter asking for representatives at the proposed conference is because these interests want to come to Washington to attend the conference "to protect their own interests."

They feel, it is reported, that if Major Berry packed the conference with the labor element some resolutions might be passed antagonistic to industry and that it will be better for them to be on the inside looking out than to remain on the outside looking in.

It is reported that Major Berry is most anxious to get the President to address the first meeting of the proposed conference, and that after a short general session the conference will be divided up into round table discussions between related industries. This has now been definitely decided upon.

Major Berry has stated that he hopes, as the result of these round table discussions, to obtain data for the NRA extension in some form, and he insists that he has no apprehensions as to the success of the conference and believes that a basis can be worked out for permanent legislation.

While no confirmation can be obtained, it is also reported that both the senate finance committee and the house ways and means committee have experts working on the NRA question. This was asked for by the President in his letter to these two bodies at the end of the last session of congress.

Probes Consumption of Scrap

In regard to the steel study being made by NRA, R. W. Shannon, in charge of it, has dispatched questionnaires to the entire industry. Information is sought which the American Iron and Steel institute, New York, cannot supply, such as amount of home and other scrap being used, and comments on price discrimination during and since the code period. Statements concerning unfair practices and labor conditions are sought, all on a confidential basis, it is explained.

The advice of James A. Emery, chief counsel for the National Association of Manufacturers, at the American Institute of Steel Construction convention at White Sulphur

Springs, W. Va., to beware of a revived NRA nettled Major Berry considerably. Friday he issued a statement claiming "there is no plan under way in my office to revive the NRA" and said there is a general agreement that no emergency legislation is required.

FTC MORE SECRETIVE ON TRADE PRACTICE RULES

In an effort to expedite its work on trade practice conferences the federal trade commission is cutting out some of its procedure, much to the disadvantage of the interested trades.

While the commission never was verbose about this work, there always was a certain procedure nearing the end of the time when the rules were actually adopted. At that time the commission called a public conference at which any member of the interested trade was given a chance to make such statement as he wished. The press was always admitted to these public hearings. The commission has now eliminated these hearings entirely.

This means in effect, it is pointed out, that a small part of any industry can get up its trade rules and push them through without all parts of the industry knowing just what is going on.

Questioned on this point, one official of the commission pointed out that these rules are made public before they are finally adopted. However, it is seldom, if ever, that any of the daily newspapers carry all of these rules when they are made public, so that the manufacturer back home has no way of knowing just what is going on in connection with these rules unless he happens to belong to the trade association.

This is all being done, it is stated at the commission, in an effort to get as quick action as possible on trade practice rules.

14 MONTHS BEFORE SECURITY LEVIES FALL ON INDUSTRY

The iron and steel industry is much interested in the working-out of the social security act.

Up to this time, no rules or regulations have been promulgated and it probably will be sometime before they are.

The board is practically hamstrung because of lack of appropriations, due to failure of passage of the deficiency bill through the filibuster of the late Senator Huey Long during the closing hours of congress.

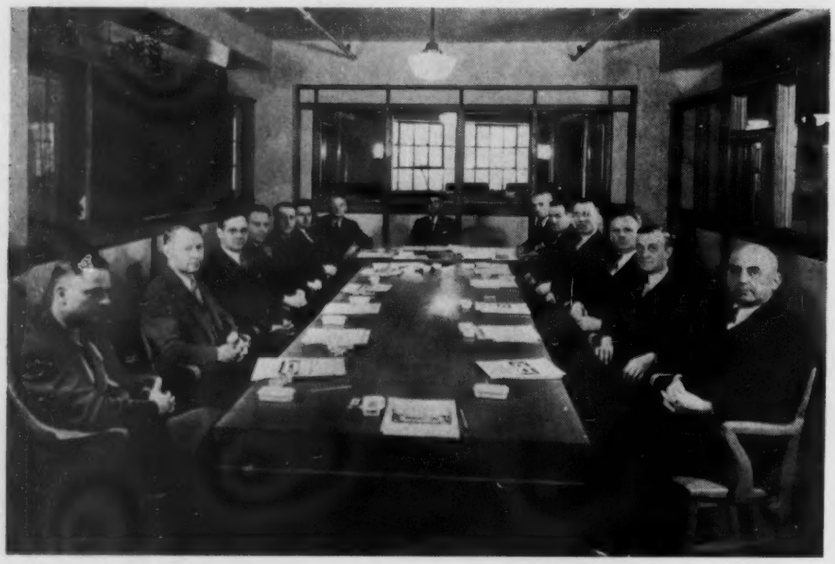
The first taxes for which employers are liable under this act will be for 1936. This tax will amount to 1 per cent of payrolls, but no report or payment of the tax is due until Jan. 31, 1937. Taxes for old age retirement purposes begin to accrue on Jan. 1, 1937.

This should be of interest to the industry, because it means that it will be more than a year before any payment of the new federal taxes will be required.

The social security board, headed by Former Governor Winant of New Hampshire, has ahead of it the task of determining the conformity to federal standards of state unemployment benefit laws. Only eight states and the District of Columbia now have such laws.

In accordance with provisions of the federal statute, unemployment benefits cannot be paid under a state law until two years after contributions thereunder become payable.

Steel, Ceramics and Automotive Stamping Join in New Industry



PLUMBING fixtures deep-drawn from steel sheets and finished by the wet process of enameling which gives an acid-resisting porcelain enamel surface in single and two-tone effects were approved Oct. 8 at a conference of steel, ceramic, and automotive stamping leaders at the Briggs Mfg. Co., Detroit. The new plumbing ware division of Briggs, with John A. Callahan as manager, is now producing such fixtures. From left to right are C. A. Dutton, ceramic sales and industrial chemicals, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.; Dr. J. J. Canfield, authority on ceramics and metallurgy; Prof. R. M. King, Ohio State university, technical adviser to the Ceramic institute; G A. Schwartz, Porcelain Enamel & Mfg. Co., Baltimore; Dr. Spencer Strong, technician in ceramics; A. Ault, ceramic control man, Briggs plumbing ware division; R. A. Weaver, president, Ferro Enamel Corp., Cleveland; Mr. Callahan; S. Hemsteger, ceramic graduate and chief inspector, Briggs plumbing ware division; Lyman C. Athy, metallurgist, chemist and production manager, Briggs plumbing ware division; Prof. J. E. Hansen, author of "The Advanced Technique of Porcelain Enameling" and other textbooks; Prof. A. I. Andrews, department of ceramic engineering, University of Illinois; Prof. W. Knowles, past chairman, enamel section, Ceramic institute; Dr. Anson Hayes, director of research, American Rolling Mill Co., Middletown, O.

Meetings

NATIONAL Machine Tool Builders' association, Cleveland, will hold its 34th annual convention at Hot Springs, Va., Oct. 26-29. A meeting of the lathe group and the budget committee will be held Oct. 26. Directors meet Oct. 27. The first convention session will be held Oct. 28, and the second, when officers will be announced, Oct. 29.

FOUNDRY EDITORS TO ADDRESS PITTSBURGH FOUNDRYMEN

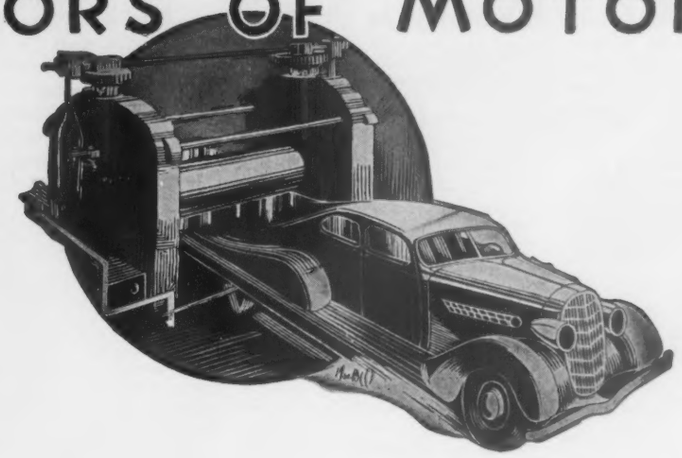
Pittsburgh Foundrymen's association holds its initial meeting of the 1935-36 season in the Norse room of the Fort Pitt hotel, Pittsburgh, Oct. 21. Following dinner to be served at 6:30 p.m., Pat Dwyer, engineering editor, *The Foundry*, will speak on "Gates and Risers." Dan M. Avey, editor, *The Foundry*, and president, the A.F.A., will attend.

REFRIGERATION INTERESTS SEE NEED FOR "BREATHING SPELL"

Most pronounced optimism in several years was voiced at the annual meeting of the Refrigeration Machinery association in Chicago, Oct. 11. Said D. Norris Benedict, president: "If only industry can bend its efforts toward producing and selling goods rather than in dodging legislative blackjacks, many of the present economic problems will be solved."

Standard methods for testing mechanical condensing units were adopted. The broad standardization program presented by the association's standards committee was adopted; this embraces practically every type of equipment and many trade practices.

MIRRORS OF MOTORDOM



DETROIT

TO MAKE this city forget its 1935 world series and baseball deities, it required an event as important as announcing the new Ford for 1936 on last Saturday.

That base hit that broke up the ball game two weeks ago and gave Detroit its first world championship was, up until last week-end, a burning topic of conversation in this town—until Henry Ford unveiled his new automobile.

To begin with, it was a good thing for Ford that Detroit won the flag; secondly, it was clever strategy by Detroit's No. 1 citizen to catch public excitement at its peak and choose so propitious a moment for the new model fanfare.

Detroit credits Ford with a master stroke. His sponsorship of the baseball radio broadcast was on everyone's mind. That the new model should come forth when it did, was more than clever promotion work.

Thus, a new car that centers its changes in hood grille and wheel styling—to the absence of major mechanical change—was given as good a launching as could be engineered.

Other Debuts Imminent

Little wonder then that Plymouth chose Oct. 26 for its 1936 model announcement, or that Chevrolet lay back until the date of the show—Nov. 2—for its debut. In fact, the more it appraises the current jockeying for starting place, Detroit cannot help but concede an orchid to Ford.

The 1936 race for supremacy among the "big little three" may be a tight one—only the ensuing 12 months can decide, but Ford doubtless took all the promotional precautions known to garner for itself a No. 1 post.

At this writing, a full two weeks before the New York show, the majority of 1936 models have been announced, and thereby arises evidence again of the automobile industry's keen competition.

Some months ago, in efforts to even out employment curves, the industry sitting in aggregate decided to move up the usual January show by two months. They concurred that Nov. 2 would be the date for the first show, as usual in New York. But building a new car for a set time and holding back when it's done seems to be like holding a hot potato.

First Buick, then Lafayette, Oldsmobile, Cadillac, LaSalle, Packard, Pontiac, and Ford have all theoretically jumped the gun. Even moving the show up two months wasn't enough for them. Each had to have a "preliminary" announcement. So much so that you can't today get even descriptive literature on any of the new cars, which includes the box score specifications, and you won't be able to, until Nov. 2.

Stresses Detail Changes

"Here's the Ford for 1936. Let's take a look at it"—was Edsel Ford's talking-picture message to Ford dealers at previews of the new car early last week. Unlike last year, the telephone hookup whereby Mr. Ford talked to the dealers, wasn't used.

Lacking any motor, brake, frame, or springing change, the Ford V-8 for 1936 makes a feature out of detail refinements.

Through the new pressed steel wheels—entirely supplanting wire spokes which definitely are out—plus a more generous application of stainless steel trim and the two sheet metal pieces between the front fenders and hood, steel stands to benefit from only a slightly increased tonnage over 1935.

The new cold pressed steel wheel, one of the most noticeable features of the 1936 cars, is formed from a steel sheet, blanked to a disk 0.110-inch thick. Small punched sections at the rim simulate spokes, but the wheel is novel in that the center section is welded to the rim at every point.

Into the back of this disk is fitted the brake drum, with the result that the bolt circle of the former is so large that the wheel virtually consists of a rim attached to the brake drum.

The hub caps, with polished centers, are stainless steel, are 12½ inches in diameter, and carry the V-8 insignia with a larger and more pronounced motif. The pressed wheel, which has completely ruled out spoke wire, saves almost 5 pounds per wheel, or a 20-pound reduction in unsprung weight per car.

The other change of major interest to the steel field is in the radiator grille. In the first place, the greater length of the top of the hood has caused the top of the grille to be brought foward slightly, decreasing the radiator's slope. The grille is strictly speaking, not part of the radiator for it is bolted onto the comb. The grille itself has a decreased slope and is more pointed from the 1935 model; it also has dropped the four horizontal fins.

Engine Cooling Improved

The vertical grille bars, which are chromium plated in the deluxe cars and painted body color in those without deluxe equipment, have rustless steel center strips and molding on all models.

By using copper and brass parts under the front fenders and under the hood side louvres, which are intended as air scoops, air circulation through the engine is improved. Also to lick the cooling problem, capacity of the water cooling system has been increased ½ gallon to 5½ gallons total.

The use of two sheet metal sections between the hood and front fenders has been the basis for mounting the lamps, which, contrary to first report, are not mounted on the fenders themselves.

but instead are set up on vertically placed brackets.

The bottom edges of both the fender flares and the grille curve under the foreward edge of the car, more completely concealing the running gear and tending to produce a streamline effect.

To complete the description of the V-8 front, the hood side louvres are new and more closely spaced. Depending upon whether the model is deluxe or not, the louvres are either stainless or body color.

Mechanically, the Ford V-8 motor remains unchanged with a $3\frac{1}{16}$-inch bore and $3\frac{3}{4}$-inch stroke. Chassis holds to a 112-inch wheelbase and continues to have an 8-inch channel frame depth.

However, steering effort has been reduced approximately 25 per cent by increasing the overall steering ratio from 15 to 1 to 17 to 1. The length of the right steering spindle arm has been increased ½-inch to bring the drag-link more nearly parallel with the front axle.

A new adjustable drag-link makes is always possible to set the "high spot" on the steering sector to conform with the straight ahead position of the front wheels, giving convenience in both manufacturing and servicing.

Antifriction Bearings in Steering

The worm and sector are now lapped. Another change is in the mounting of the pitman arm shaft on straight needle roller bearings, making all bearings in the steering gear case antifriction.

Another departure involves a helical gear for both low and reverse speeds, that, already on second and third speeds in the 1935 car, should insure more silent operation. The synchronizer between second and high gears is retained. Large floating thrust washers for the helical gears increase bearing surface and assure longer wear.

The movement of the gearshift lever has been decreased $\frac{5}{8}$-inch from neutral into all four speeds by moving the top of the shifter tower forward on the floor board. This modifies the leverage between the gearshift ball and slide bars and takes the "kink" out of the gearshift lever arm, making the claim of "three to a front seat" now more nearly accurate.

Minor Ford interior changes include an increase of 3 inches in width of the sedans through the use of vertically-hinged rear quarter windows which eliminate operating mechanism formerly under them. Fuel and oil gages are electric; they were hydrostatic formerly.

To the instrument board, finished in gray pyroxolin, has been added a water temperature indicator. An innovation in the coupe is the hinge at the top of the passenger's seat, permitting it to be lifted like a gate for entry into the rear compartment from the front seat.

The 1936 line includes ten body types, three of which are offered without deluxe appointments. The deluxe convertible is continued, a model first out in 1935. Deluxe body colors have been increased by two this year, a green and a blue.

Ford has stuck to an unchanged design of mechanical brakes. Carried over, too, were transverse springs, front radius rods, full torque tube driven, cast alloy steel crankshafts, and precision set non-adjustable valves.

Speaking of torque drive, Ford has recently installed an unusual machine at the Rouge plant, made by a Philadelphia concern, that tests all drive shafts. It remarkably records shaft whip under varying conditions.

Making Large Steel Buy

So much for Ford's changes. In themselves, even though they don't embrace the complications of engine change, they've been enough to cause manufacturing delays. Up until last week, Ford had not yet formulated a production schedule by months for the remainder of 1935, but was hoping to get to 4800 jobs a day before long.

Against late fall assemblies, Ford was making a steel buy last week, first of any importance since last July. For one thing, up till now the new radiator shell, with its 50-odd brazing operations, has been a bottle-neck; production hasn't been as smooth as it might be on this part. McCord and Motor Products are making most of the radiators, until Jan. 1 at least.

Chevrolet was host on Oct. 14, 15 and 16 to over 1000 field men, giving them all a shot of 1936 optimism. They journeyed to the General Motors proving grounds and saw the coming Chevrolet put through its paces, heard sales talks and went away with chests bulging.

Mechanically, Chevrolet, like Ford, is confining its changes to minor improvements. Probably its major change—aside from hydraulic brakes to which General Motors have swung over—is in an increase of the 6-cylinder motor's compression, to 6 to 1. Pistons are electroplated with tin.

The Chevrolet radiator grille, front fenders, and method of door swinging are moderately refined. Contrary to brothers Olds, Pontiac, and Buick, Chevrolet's radiator grille is not die cast, but consists of vertical fins, the widest of which is down the center. As the fins move away toward each side they grow correspondingly thinner, giving the appearance to the entire front end of a point and the visual effect of thinness and streamline characteristics. The thinnest fins, therefore, are the ones closest to the sides. A very slight modified sweep to the bottom of the grille has been made.

Interior Refinements

In the interior of the car the usual "dress-up" has taken place. A more striking instrument board has been adopted. The front seat has been changed so that the driver may adjust individual leg room without disturbing the space for the second and third front-seat passenger. Incidentally, like Ford and others, a big play in 1936 seems to be set to revolve around "room for a third in the front."

As previously relayed, the method of swinging the 1936 Chevrolet doors has been completely reversed, just as Pontiac is doing. The Chevrolet vertical windshield partition has been retained for 1936. Chevrolet has lengthened its wheelbase 3 inches to 110 inches, thus closer to Ford's unchanged 112-inches.

Which brings the discussion to an interesting phase on Chevrolet's coming merchandising. In the first place, the public won't see the car until Nov. 2, but by that time 60,000 models will have been placed in dealers' hands.

Of that first 60,000—and likely more depending on headquarters' policy to be determined within the next few days—fully 70 per cent will be decked out in light blues, greens, and tans.

Chevrolet is borrowing a page from Plymouth's self advertising of a few years back with the "flame car," figuring that light colors,

(*Please turn to Page* 91)

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,321
July	229,357	264,933	337,044
Aug.	232,855	234,811	240,051
Sept.	191,800	170,007	*77,000
9 mo.	1,634,126	2,384,014	*2,916,240
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Oct. 5	24,770
Oct. 12	31,643
Oct. 19	44,416

Industrial Men in the News

ARTHUR SCHAEFFER, district manager of the Republic Steel Corp. in Detroit, now heads up the enlarged organization there resulting

Arthur Schaeffer

from the acquisition of the Corrigan, McKinney Steel Co. and Newton Steel Co.

Mr. Schaeffer is well known in the steel trade, having been associated with it for the past 36 years. He joined the Carnegie Steel Co. in 1899, and subsequently became associated with the Central Alloy Steel Corp. Central Alloy merged in 1930 with the Republic Iron & Steel Co., Bourne-Fuller Co., Donner Steel Co., and several other companies to form Republic Steel Corp.

Whitford C. Gillies, formerly in charge of Detroit district sales for Corrigan-McKinney, is continuing with Republic in a sales capacity. He is the son of Donald B. Gillies, former Corrigan-McKinney president and now vice president and director of Republic.

Charles Poxson continues as Detroit representative for the Newton Steel Co.

The expanded Republic Steel Corp. has taken over the entire twentieth floor of the Fisher building.

♦ ♦ ♦

John S. Garceau has been appointed advertising and sales promotion manager for the entire commercial products line of Kelvinator Corp., Detroit. Mr. Garceau has been affiliated with Kelvinator since 1927, in the advertising and sales promotion divisions.

♦ ♦ ♦

Marcus J. Aurelius, for the past four years associated with the Colorado Fuel & Iron Co., Denver, in a sales capacity, has been appointed district manager of the company's new branch

Marcus J. Aurelius

office in Chicago, with headquarters at 602 Railway Exchange building. Principal products handled include railroad steel, merchant bars, wire, coal and by-products.

♦ ♦ ♦

Robert E. Parkinson has recently joined the staff of Battelle Memorial institute, Columbus, Ohio. Mr. Parkinson was formerly with the Inland Steel Co. He has been assigned to the division of physical metallurgy.

♦ ♦ ♦

R. L. Kenyon, supervising research engineer, in charge of methods of physical testing and their development in the research laboratories of the American Rolling Mill Co., Middletown, O., has been placed in charge of all metallurgical work in the manufacture and development of the company's wrought steel wheels.

♦ ♦ ♦

H. M. Northrup has been appointed chief engineer in charge of all engineering activities of the Hudson Motor Car Co., Detroit. He will operate under the direct supervision of vice president and assistant general

A. H. Warren Jr., Manager of Sales of Structurals and Plates, Carnegie-Illinois Steel Corp.

He now heads up structural and plate sales of Carnegie-Illinois organization.

He has been with the Corporation almost continuously since graduation from college.

During the World war he served overseas with American expeditionary forces.

A. H. WARREN JR., as noted in STEEL for Oct. 14, has been appointed manager of sales of the structural and plate division of the newly-organized Carnegie-Illinois Steel Corp., with headquarters at Pittsburgh.

Upon graduation from the University of Minnesota, Mr. Warren was employed by the Illinois Steel Co., a subsidiary of the United States Steel Corp., in the St. Paul district sales office, serving in various capacities.

Mr. Warren has spent his entire business career with the Illinois Steel Co., except for the duration of the World war, when he was overseas with American Expeditionary forces.

Resuming his duties in St. Paul, upon conclusion of the war, Mr. Warren was promoted to manager of sales, a position he has held until now.

manager S. G. Baits, for many years Hudson's chief engineer.

Mr. Northrup has been assistant chief engineer since 1929. He is a graduate of the Michigan College of Mining and Technology, and joined Hudson in 1919. In 1920 he was put in charge of a special division of the engineering department which, in addition to taking care of all physical, chemical, and metallurgical experimental work for the engineering department, also has charge of all inspection of production materials and their physical, chemical, and metallurgical characteristics and supervises the operation, heat-treatment and similar technical processes in the production department. He held that position until his appointment as assistant chief engineer.

♦ ♦ ♦

Frederick B. Heitkamp has been elected vice president in charge of sales of Lyon Metal Products Inc.,

Frederick B. Heitkamp

Aurora, Ill. Mr. Heitkamp became affiliated with this company in July, 1934, as general sales manager. He formerly was sales manager of the Cincinnati Milling Machine Co. and Cincinnati Grinders Inc.

♦ ♦ ♦

Henry G. Johnson Jr. has been appointed director of engineering in the department of public works for Pittsburgh.

♦ ♦ ♦

M. S. Metzger has been appointed general foundry manager for Chrysler Corp., Detroit, succeeding the late Merton B. Lamkins.

♦ ♦ ♦

Kennedy Beeson has been appointed manager of manufacturers' products sales for Pittsburgh Steel Co., Pittsburgh. Mr. Beeson has been connected with this company for the past five years, first in production and later in sales capacities.

♦ ♦ ♦

Neil M. Gibson, formerly field engineer for the Bethlehem Steel Co., is now located at 2712 Derby street, Berkeley, Calif.

♦ ♦ ♦

W. B. Cramer, chief metallurgist, American Ball Mill Co., Denver, has been appointed assistant professor of ore dressing at the Colorado School of Mines, Golden, Colo.

♦ ♦ ♦

C. H. Corbus, former chief chemist for the Nevada Consolidated Copper Co., Hayden, Ariz., has joined the staff of the Southwestern Engineering Co., Los Angeles.

♦ ♦ ♦

Chester M. Kuhns has resigned as Milwaukee representative of the Youngstown Sheet & Tube Co., to become manager of a new Milwaukee office established by the Otis Steel Co., Cleveland, in the Mariner tower, 606 West Wisconsin avenue.

♦ ♦ ♦

Morris Horne, formerly associated with Jay G. Stephens Corp., Koppers building, Pittsburgh, has severed his association to become vice president and purchasing agent of the Pitt Metals Co., 4314 Main street, Pittsburgh, recently organized to engage in the smelting and refining of metals.

♦ ♦ ♦

M. I. Arms, who has been president of the Aetna-Standard Engineering Co., Youngstown, O., since its organization has been elected vice president.

Jerome R. George, as noted in STEEL for Oct. 14, was elected president. He formerly was with the Morgan Construction Co., Worcester, Mass.

♦ ♦ ♦

Charles F. Scott, professor-emeritus of electrical engineering, Yale university, was elected chairman of the Engineers' Council for Professional Development at the third annual meeting held in New York, Oct. 8.

George T. Seabury, secretary of the American Society of Civil Engineers, was re-elected secretary of the council.

♦ ♦ ♦

Charles A. Fitz-Gerald, who has been sales representative of Sloss-Sheffield Steel & Iron Co. in the St. Louis territory for more than 20 years, has been placed in charge of the Chicago territory also.

Mr. Fitz-Gerald is a native of Alabama, and started his career with Sloss-Sheffield in 1904, being sent to St. Louis in 1911. Associated with him in the St. Louis office is Charles A. Fitz-Gerald, Jr., a graduate of the University of Cincinnati school of engineering.

♦ ♦ ♦

John E. Nelson, manager of northern ore mines for Republic Steel Corp., Youngstown, O., has been appointed manager of the combined Republic mines and the mining properties formerly owned by the Corrigan, McKinney Steel Co. He will have charge of a total of 11 active mines in Michigan and Minnesota.

Mr. Nelson was associated with the Republic Iron & Steel Co. since 1899, and has been with Republic Steel Corp. since the formation of the company. He will have his headquarters in Duluth.

Murray Redell, who was in charge of the Corrigan-McKinney mines, will be Mr. Nelson's assistant.

♦ ♦ ♦

William M. Black has been elected vice president in charge of sales of the American Manganese Steel Co., Chicago Heights, Ill. Mr. Black first entered the employ of the company in 1912, when he undertook a training course in the Chicago Heights foundry, which extended over several

William M. Black

years. After this he entered the sales department, and before long he was placed in charge of the Pittsburgh office. In 1927 he became eastern sales manager at New York, and in 1934 was appointed general sales manager at Chicago Heights.

♦ ♦ ♦

Robert A. Marble has been appointed manager of sales engineering for the general sales department of Carnegie-Illinois Steel Corp. Mr. Marble previously was an assistant in the structural and plate bureau, and succeeds William C. Oberg, who has been made manager of operations in the Pittsburgh district, as noted recently in STEEL.

♦ ♦ ♦

David T. Marvel has been transferred from the Canton office of the Timken Steel & Tube Co., Canton, O., to Chicago, to act as sales represen-

tative and assistant to E. F. Talmadge.

C. Sidley Craine also has been transferred from Canton to Detroit, to act as sales representative and assistant to R. Atkinson.

The changes have been made to meet the increasing demand for Timken seamless tubing in the Chicago and Detroit districts.

♦ ♦ ♦

George R. Woods, manager of R. S. Stokvis & Sons Inc., 17 Battery place, New York, sailed Oct. 18 to visit various Stokvis offices in Europe.

♦ ♦ ♦

P. M. Mahler, president of P. M. Mahler & Co. Inc., 80 Broad street, New York, is sailing for South America shortly to represent various machinery and equipment companies.

♦ ♦ ♦

H. D. Richardson, formerly with American Steel Foundries, Chicago, has become affiliated with the Ralston Steel Car Co., Columbus, O., as a special sales representative. Mr. Richardson, a graduate of Purdue university in 1917, has had many years experience in the railroad and equipment field.

♦ ♦ ♦

L. H. Burnett, who has been vice president of the Carnegie Steel Co. has been appointed vice president of the new Carnegie-Illinois Steel Corp., Pittsburgh, in charge of legal matters.

James W. Hamilton, secretary of the Carnegie company, carries on in that capacity for the new corporation.

♦ ♦ ♦

T. H. Strate, division engineer of the Milwaukee road at Chicago, has been elected president of the American Railway Bridge and Building association. Mr. Strate served as first vice president of the association the past year. He has been associated with the Milwaukee road since 1901, having been division engineer in Chicago since 1933.

♦ ♦ ♦

Lloyd R. Jackson has recently joined the staff of Battelle Memorial institute, Columbus, O. Mr. Jackson was formerly assistant research supervisor for the Jones & Laughlin Steel Corp., Pittsburgh, and has a wide experience in the manufacture of steel and steel products. He has been assigned to the division of general metallurgy.

♦ ♦ ♦

J. C. Argetsinger, vice president, Youngstown Sheet & Tube Co., Youngstown, O., was elected one of five directors at large of the Ohio Valley Improvement association at its convention in Wheeling, Oct. 16.

F. W. Ingraham, general sales manager, Marietta Mfg. Co., Point Pleasant, W. Va., was elected a director for the fourth district.

What Beer in Cans Means TSto eel Industry

SURVEYING the market for beer cans, the American Iron and Steel institute, New York, finds makers of cans rushing plans for an outlet of 1,500,000,000 *cans in* 1936.

This will require 3,000,000 *base boxes of tin plate, to produce which will require* 11,500,000 *man-hours of labor, with wages of nearly* $8,000,000. *These figures are exclusive of the labor required in factories making cans, and of labor, wages and materials to make machinery and equipment to produce the cans.*

For 1936 *the estimated consumption of beer is* 48,000,000 *to* 50,000,000 *barrels, of which* 70 *per cent will be draught beer and the remaining* 30 *per cent will require nearly* 5,000,000,000 12-*ounce containers—of which can makers expect to supply nearly one-third.*

Died:

FRANK ARTHUR HATCH, 57, president of the Shepard-Niles Crane & Hoist Co., Montour Falls, N. Y., in that city, Oct. 15. Born in Bay City, Mich., he was graduated from the University of Michigan, and went to Detroit with the Union Trust Co. In 1902 he left to establish his manufacturing business at Montour Falls.

♦ ♦ ♦

Philip Wick, 49, former director of the Republic Steel Corp., and member of a family long identified with iron and steel in the Youngstown, O., district, in Youngstown, Oct. 11. A director in many of the companies formerly controlled by Cyrus Eaton, he was a leader in the fight to prevent the Youngstown Sheet & Tube Co. from merging with Bethlehem Steel Corp. During reorganization of the Trumbull Steel Co. he was elected temporary president in 1925, later becoming a member of the executive committee and the board of directors. In 1927 he was named vice president of Trumbull, which subsequently was merged with Republic Iron & Steel Co. He was connected with the Gary Iron & Steel Co. in Cleveland for some years after graduating from Sheffield Scientific school of Yale university. For a time he was vice president of the Ohio Iron & Steel Co., and in 1919 was a director of Youngstown Sheet & Tube.

♦ ♦ ♦

Albert R. Longnecker, 39, manager of the Perry Furnace Co., Erie, Pa., in an automobile accident near Erie, Oct. 15.

Frank J. Johnson, 79, co-founder and former president of the American Hoist & Derrick Co., St. Paul, in that city, Oct. 15.

♦ ♦ ♦

Frank J. Stevens, 73, formerly general foreman of the International Harvester Co. works, Chicago, in that city Oct. 13. He retired ten years ago.

♦ ♦ ♦

E. Homer Fahrney, 59, founder and president of the Universal Foundry Co. and Universal Motor Co., marine engines, Oshkosh, Wis., recently.

♦ ♦ ♦

Clarence A. Seefeld, 55, president of the Suelflohn & Seefeld Co., Milwaukee, wholesale iron and steel and heavy hardware dealer, in Milwaukee, Oct. 14.

♦ ♦ ♦

John D. Robinson, 54, assistant credit manager for Carnegie-Illinois Steel Corp., at Rochester, Pa., Oct. 16. He had been an employe of Carnegie Steel Co. since 1912.

♦ ♦ ♦

Richard Denbigh, 75, who retired as vice president of the Hay Foundry & Iron Works when it was merged with Bethlehem Steel Co. in 1931, in Newark, N. J., Oct. 8. He had been with the Hay Foundry for 56 years upon his retirement.

♦ ♦ ♦

W. A. Child, 73, secretary of the Ontario Rolling Mill Co. and treasurer of the Hamilton Steel & Iron Co., Hamilton, Ont., in that city, Oct. 15. Both these companies are units of the Steel Co. of Canada Ltd. Born in Mayville, Wis., had some experience in the steel industry in this country before going to Canada.

♦ ♦ ♦

Price McKinney Jr., 24, younger son of the late president of the McKinney Steel Co., Cleveland, now the Corrigan-McKinney division of Republic Steel Corp., in Cleveland, Oct. 16. Graduate of Yale, he had worked in the Corrigan-McKinney mill and recently was transferred to the sales department.

♦ ♦ ♦

Eugene Bournonville, 73, mechanical engineer, inventor and pioneer in the development of acetylene gas illumination, in Jersey City, N. J., Oct. 14. He developed the oxyacetylene gas torch and the welding process used with it. Recently he was reported to have developed a rotary valve for automobile engines, after 25 years of experiments. He was a partner in the former engineering organization of Davis-Bournonville & Co.

♦ ♦ ♦

Charles M. Power, 67, sales manager of the Cleveland Chain & Mfg. Co., Cleveland, in an Akron, O., hospital Oct. 15, as a result of in-

juries received in an automobile accident. Before becoming associated with the Cleveland company 10 years ago, he was general manager of the Seneca Chain Co., Kent, O.

♦ ♦ ♦

George H. Green, 48, president, National Waste Co., Chicago, in Kenilworth, Ill., Oct. 13. He also was an executive of the Machine Waste Manufacturers' institute.

♦ ♦ ♦

Samuel H. Greanoff, 75, retired construction engineer for the Bethlehem Steel Co., in Cleveland, Oct. 11. Born in England, he came to this country 45 years ago and retired several years ago after serving with Bethlehem for 10 years.

♦ ♦ ♦

Ernest S. Hirschberg, 52, chief engineer of the Dings Magnetic Separator Co., Milwaukee, Oct. 10. He was graduated from the University of Wisconsin in 1907 and became affiliated with the Dings company in 1914.

♦ ♦ ♦

C. J. Stanley, 61, vice president of the L. A. Darling Co., Bronson, Mich., manufacturer of metal display fixtures and for 41 years vice president and general manager of the M. I. Wilcox Co., Toledo, O., wholesale hardware company, in Coldwater, Mich., Oct. 10.

♦ ♦ ♦

Alexander S. Henry, vice president, and a director of the American Locomotive Co., New York, and president of the Canadian Steel Tire & Wheel Co. Ltd., Montreal, Que., in New York, Oct. 10. Born in Manchester, England, he came to this country as a young man and joined the Paige Car Wheel Co., Cleveland. This company later was merged with the Railway Steel Spring Co., of which he became president. Later this company, in turn, was merged with the American Locomotive Co.

♦ ♦ ♦

Col. Claire Foster, 65, retired steel contractor and former executive vice president of the Bush Terminal Railroad Co., Brooklyn, N. Y., in Denver, Oct. 2.

♦ ♦ ♦

James F. Digan, 72, founder and president of the Logansport Radiator Equipment Co., Logansport, Ind., in that city, Sept. 30. He was prominent in civic life of the city and in 1933 served as chairman of the Indiana second district unemployment relief commission. In earlier years he worked at the Southern Malleable Co., Chattanooga, Tenn., Terre Haute Car Works, division of American Car & Foundry Co.; and the Marion Gray Iron Foundry and the Marion Malleable Iron Works, Marion, Ind.

Cables of Golden Gate Bridge Carried on Cast Steel Saddles

VIVID indication of the magnitude of the Golden Gate bridge is provided by the size of the steel castings shown here, which are employed to support the cables on the tops of its towers.

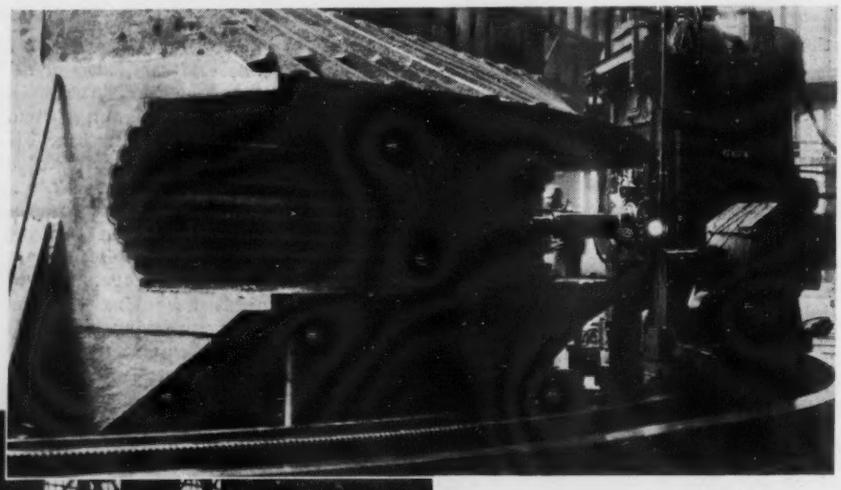
Each cable support or saddle consists of three segments bolted together, weighing approximately 150 tons. The maximum metal thickness is 7 inches. Their inner grooved surfaces are designed to provide smooth curved supports for the cables.

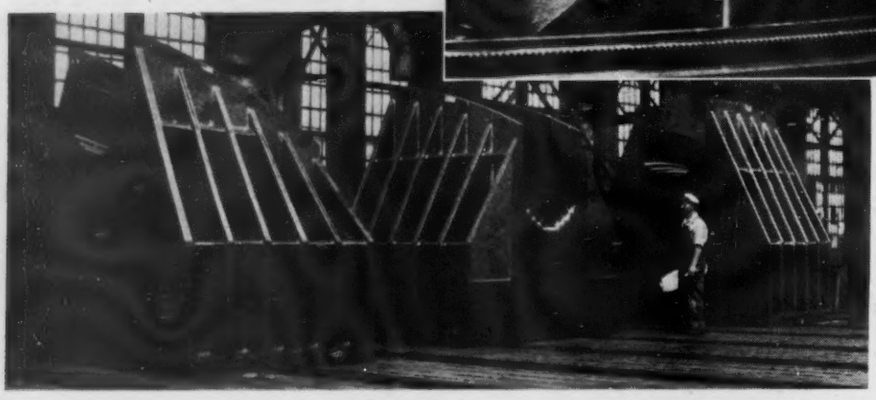
Mounted on the tops of the towers, the saddles rest on nests of rollers, and in their original positions are set shoreward, 3 to 5 feet from their final position. As the construction of the suspended portion of bridge structure proceeds, the cables tend to decrease in sag and elongate slightly, with the result that the saddles gradually move bayward as the weight increases, until they are in final position centered on the towers when the structure is completed. In this position the rolls will be killed and the saddles fixed or anchored permanently to the tower tops.

These huge castings originated in the steel foundry at the Bethlehem, Pa., plant of the Bethlehem Steel Co., where the casting and rough machining operations were performed. They were finish machined by the Midvale Co., Nicetown, Philadelphia.

Two open-hearth furnaces were required to provide sufficient steel for these castings. The plain carbon steel was teemed from them simultaneously into large ladles, from which it was poured into pit molds that had been arranged for bottom pouring, with nine risers per segment.

Following the removal of the risers, the segments were annealed to remove internal stresses, and rough machined at Bethlehem before being shipped to Midvale for finish machining operations.





At the left—these three segments, bolted together, form a complete saddle, one of two that crown the towers of the Golden Gate bridge.

Above—milling grooves for the cables in a gang of saddle castings at Midvale. Photos courtesy of the Bethlehem Steel Co.

EDITORIAL

Abolition of War Would Be Godsend to Industry

> "Men of industry consider war a great destroyer and an unsettler of their affairs, and all would welcome its abolition. The last war in its ultimate effect nearly destroyed all industry. Industry comes on the scene only after statesmanship and diplomacy have failed, or when government itself fears its inadequacy or failure."

THESE words are from the lips of Myron C. Taylor, chairman of the United States Steel Corp. They were uttered Sept. 28 at Kearny, N. J., on the occasion of the launching of the United States destroyer FLUSSER. Coming from the head of the world's largest steel organization, which in the past has produced millions of tons of materials for the implements of war, the statement should go a long way toward exploding the fallacy that leaders of industry look with favor upon international hostilities.

Unfortunately, the general public has gained a distorted view of many of the aspects of the relation between war and business. The man in the street thinks that the sole effect of the World war upon American industry was to supply a ready market for guns, ammunition, ships, trucks, automobiles, etc., all of which were turned out at great profit. He will admit, if questioned, that part of this profit was offset by losses incurred in the postwar depression of 1921, but it is difficult to convince him that there is any connection between the World war and the depression of 1929-1935 or that industry's deficits in this period should be deducted from its profits of the war period.

Heavy Wartime Profits Do Not Accrue Solely To Metal Industries, Despite Popular Belief

Another point which seems to escape the public mind is that the great war profits which usually are ascribed to the iron, steel, and metalworking industries are matched by equal or greater profits for cotton growers, wheat farmers, and manufacturers of shoes, blankets, clothing, cigarettes, chewing gum, tobacco, etc.

It seems inevitable that after every war, when the public cry against profiteering is loudest, the targets for their protests always are the steelmakers, shipbuilders, suppliers of munitions, and others in the metalworking industries. In a number of instances, meat packers and textile manufacturers have been charged with profiteering or other sharp practices, but in the main the unsavory reputation for unholy traffic with Mars is largely confined to the steel and allied industries. Seldom does anyone raise any question as to the profits of the farmers, who receive fancy prices for cattle, hogs, wheat, corn, potatoes, etc. in time of war.

Now that questions of neutrality have been raised by the outbreak of war in Africa, it is important that industry's true position in regard to war should be explained to the public thoroughly and convincingly. Representatives of industry who are responsible for public relations might well consider the advisability of utilizing the present situation to drive home to the American public the implications of the three sentences quoted from Mr. Taylor at the beginning of this discussion.

Depression Losses, Balanced Against War Profits, Would Prove Enlightening

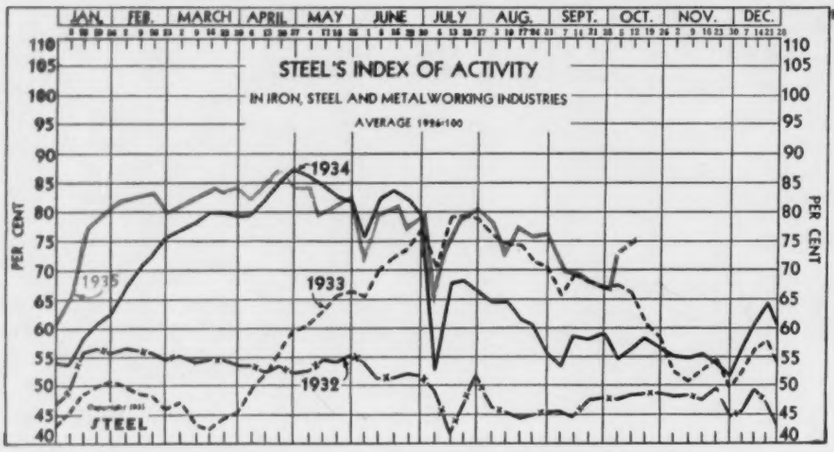
One effective way of doing this would be to paint a vivid word picture of the manner in which the last great war affected industry's balance sheet. It would be possible to show on one side of the ledger the profits, to which so much emphasis has been given, and on the other the deficits of two postwar depressions and the terrific cost of readjustments made necessary by the war. Such a balance sheet would demonstrate conclusively that the world conflict of 1914-1918, far from being profitable to industry, actually, in Mr. Taylor's words, "nearly destroyed" it.

Industry's public relations experts also should try to give wide circulation to the statement by Mr. Taylor that "industry comes on the scene only after statesmanship and diplomacy have failed, or when government itself fears its inadequacy or failure." This could well serve as the text for a discourse on the proper roles of industry and government in preparedness for war.

Apparently, someone in high authority in Washington always is ready with a plan for putting the government into the munitions business. Josephus Daniels built a government armor plate plant, and in doing so sharply curtailed the ability of three private companies to come to the rescue of their nation when and if "statesmanship and diplomacy" fail. The public should be educated to the point of demanding that the government confine its efforts to improving statesmanship, and that the job of production be left to industry.

Should statesmanship gain such stature that it can prevent nations from jumping at each others' throats, industry will be the gainer by long odds.

THE BUSINESS TREND



STEEL's *index of activity in the iron, steel and metalworking industries increased 2.4 points to 75.7 in the week ending Oct. 12:*

Week ending	1935	1934	1933	1932
Aug. 3	78.4	64.6	75.9	45.1
Aug. 10	73.4	64.6	74.7	44.6
Aug. 17	77.5	61.4	74.2	44.9
Aug. 24	77.0	60.3	71.6	45.2
Aug. 31	77.3	55.1	70.3	45.4
Sept. 7	70.9	53.5	65.5	44.9
Sept. 14	70.1	58.7	69.1	47.8
Sept. 21	69.4	58.1	68.2	48.0
Sept. 28	68.5	59.3	66.9	47.7
Oct. 5	73.3†	54.7	67.4	48.4
Oct. 12	75.7*	56.4	66.0	48.7

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL.) *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Car Loadings Gain; Power at Another High; Index Rises

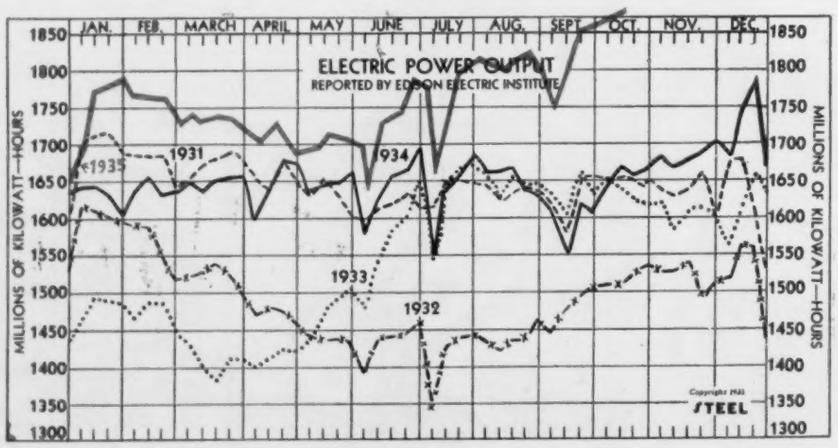
RECORDS are coming easily these days. In the week ended Oct. 12 electric power made another all-time high when the output was 1,867,100,000 kilowatt hours; only the week previous a new high also was set.

Freight car loadings, at about 773,000, topped every week since early October, 1931. In fact, save for this week and the one ended May 2, 1931, loadings were at the highest level since late 1930. At the peak of 1929 the railroads loaded 1,202,000 cars of freight in one week, thus making the current week's loading about 65 per cent of normal.

Notwithstanding these excellent showings in electric power production and car loadings, accompanied by further gains in automobile assemblies, steelworks operations find it difficult to get away from the 52 per cent mark. For ten weeks, the rate has hovered between 51 and 54 per cent.

STEEL's index of activity has risen to 75.7, a gain of 2.4 over the revised index for the preceding week.

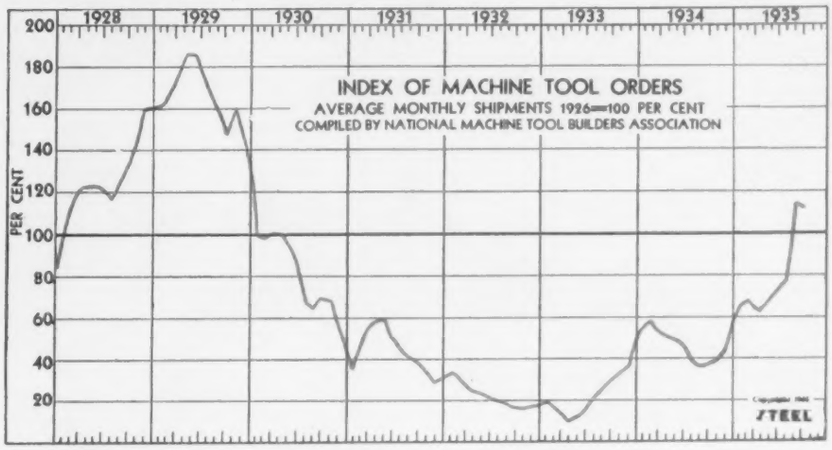
Million Kw.-Hr. 1935	
Oct. 12	1,867
Oct. 5	1,863
Sept. 28	1,857
Sept. 21	1,851
Sept. 14	1,827
Sept. 7	1,752
Aug. 31	1,809
Aug. 24	1,839
Aug. 17	1,832
Aug. 10	1,819
Aug. 3	1,821
July 27	1,823



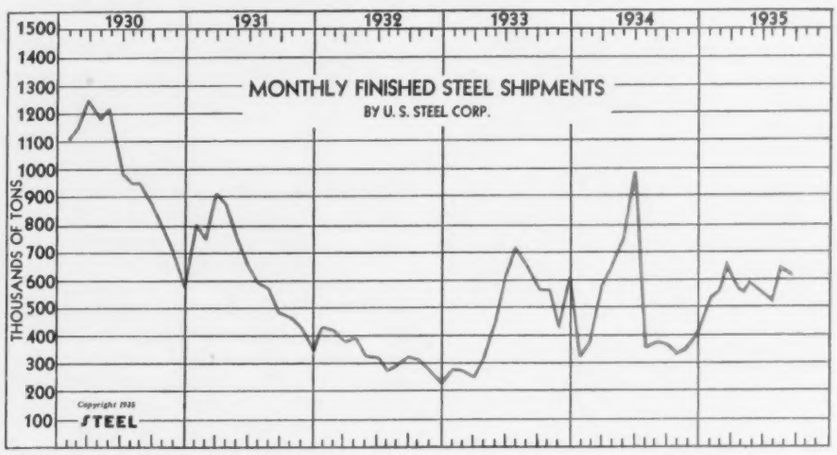
Million Kw.-Hr. 1934	
Oct. 13	1,656
Oct. 6	1,659
Sept. 29	1,648
Sept. 22	1,630
Sept. 15	1,633
Sept. 8	1,564
Sept. 1	1,625
Aug. 25	1,648
Aug. 18	1,674
Aug. 11	1,659
Aug. 4	1,657
July 28	1,683

Machine Tool Orders Show Slight Drop

	1935	1934	1933	1932
Jan.	61.3	56.5	18.3	32.8
Feb.	61.5	58.2	15.2	30.4
March	60.3	50.9	11.1	23.9
April	60.3	48.5	8.3	20.6
May	67.1	46.8	10.6	20.8
June	76.7	42.6	15.5	21.7
July	94.7	38.6	22.4	18.7
Aug.	112.2	37.1	27.9	16.8
Sept.	108.5	37.4	30.9	15.3
Oct.	.....	40.5	33.3	15.7
Nov.	.....	44.2	38.0	16.4
Dec.	.....	54.1	51.0	17.6



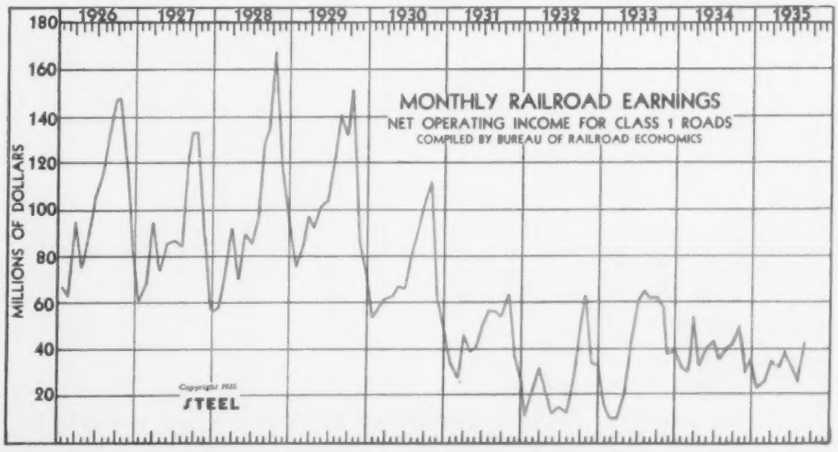
Finished Steel Shipments Decline Moderately



	Gross Tons		
	1935	1934	1933
Jan.	534,055	331,777	285,138
Feb.	583,137	385,500	275,929
March	668,056	588,209	256,793
April	591,728	643,009	335,321
May	598,915	745,063	455,302
June	578,108	985,337	603,937
July	547,794	369,938	701,322
Aug.	624,497	378,023	668,155
Sept.	614,933	370,306	575,161
Oct.	.....	343,962	572,897
Nov.	.....	366,119	430,358
Dec.	.....	418,630	600,639

Railroads Earn 1.66% In First Eight Months

	1935	1934
Jan.	$21,348,557	$30,931,202
Feb.	25,719,919	29,281,013
March	37,850,965	52,037,848
April	34,625,786	32,264,610
May	39,505,069	39,494,978
June	34,024,691	41,836,302
July	26,851,397	35,220,809
Aug.	42,073,256	39,677,337
Sept.	.....	41,020,485
Oct.	.....	48,624,984
Nov.	.....	31,582,704
Dec.	.....	38,729,833



Reduces Defects in Steel Rails by Normalizing

BY JOHN BRUNNER

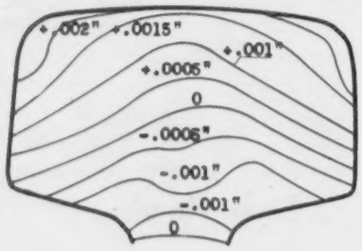
Manager, Department of Metallurgy and Inspection,
Illinois Steel Co., Chicago

A NEW normalizing process, recently perfected by the Illinois Steel Co., Chicago, for use in the manufacture of rails, produces sections having greater ductility and increased resistance to impact and to end batter. It also is believed to overcome conditions resulting in transverse fissures and other interior defects. These improved properties will tend to eliminate most of the weaknesses found in rails in service, such as broken bases, square breaks, transverse fissures, etc.

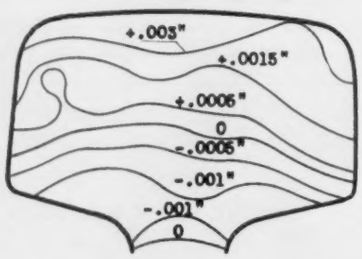
Briefly, the process consists first of air-cooling the rails after they leave the rolls, until the temperature in the interior of the section is slightly below the so-called thermal critical range, but above the thermal brittle range. The rails then are placed in a furnace and reheated under careful control until the entire section has reached a uniform temperature slightly above the thermal critical range. They then are removed from the furnace and blasts of compressed air are applied to the top of the head at both ends until the desired hardness is reached at those sections.

The normalized rails have a hardness close to that of the hot bed cooled rails, which is an average of about 250 brinell. Compressed air quenching can raise the hardness of the ends to a desired value of between 375 and 400 brinell at the top of the rail. From the ends the hardness decreases to the regular hardness of the rail head in a distance of 12 to 15 inches along the top of the rails and 1¾ to 2 inches downward along the ends of the rail sections.

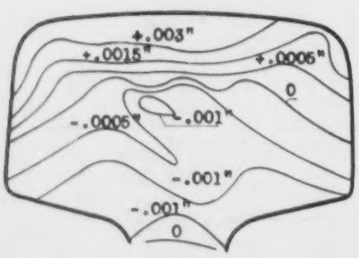
So far this process has been used only for the production of rails used in experimental tests, but plans are under way for the construction of furnace capacity to be employed commercially.



TEST C-1. NEW RAIL OF SECTION 11025.



TEST C-2. SAME RAIL AS C-1; SUBJECTED TO ONE MONTH'S SERVICE.



TEST C-3. SAME RAIL AS C-1; SUBJECTED TO SIX MONTHS' SERVICE.

+.003" = 9000 LBS./SQ.IN. COMPRESSION.
+.002" = 6000 " " " "
+.0015" = 4500 " " " "
+.001" = 3000 " " " "
+.0005" = 1500 " " " "
0 = NEUTRAL ZONE
-.0005" = 1500 LBS./SQ.IN. TENSION.
-.001" = 3000 " " " "

Distribution of stresses in a rail cooled on the hot bed when new and after one and six months service

Culminates Extensive Research

Development of this new practice is the result of more than 25 years of experiments and study, during which time thousands of tests were made before the process finally was adopted. The work was conducted in the laboratories and at the rail mills of the Illinois Steel Co. by the Gary works metallurgical organization under the supervision of the writer and A. D. Beers. Metallurgical staffs of the other rail-producing subsidiaries and the personnel of the research laboratory of the United States Steel Corp. also co-operated.

One of the first investigations was to learn why rails break more frequently at low than at high temperatures. In this study impact tests were made on standard rail pieces in a rail drop testing machine with the temperature varied from 60 degrees above to 45 degrees below zero Fahr. Results showed that the impact resistance of rails decreases rapidly with the temperature, particularly in rails with high hardening properties such as are common today.

Another investigation sought to determine whether so-called transverse fissures or interior progressive fractures could be produced in new rails through repeated stresses approaching the yield strength of the steel in the rails. Two years of continuous testing revealed that transverse fissures could be developed in various transverse locations about the middle of the rail head, depending on the place of the application of the load on top of the rail. Failure of the rails under both the low temperature and fatigue tests began in the coarser grain structure in the interior of the rail heads and spread to the surface.

These findings prompted a study to

develop means of refining the grain structure in rails by a thermal treatment, but the work was interrupted by the World war. During the war period, however, developments in heat treatment of ordnance and munition materials provided the method for eliminating interior ruptures found in alloy and carbon steels of large sections. These ruptures evidently were formed through cooling stresses which split the grain structure in the steel as it passed through the brittle cooling ranges, and, in this respect, they were related to the shatter cracks which later were found in rail head interiors.

Tests on heat treatment of rails were resumed after the war. These included controlled cooling with and without hardened ends, reheating and quenching in various quenching mediums, with subsequent drawing and special methods of normalizing with and without hardened ends. While studying quenching and drawing, it was found that the rails would have to be reheated before their temperature dropped into the so-called brittle ranges and that the quenching operation should not be longer than to carry the center of the head slightly below the critical range in order to obtain the best results in ductility and to prevent thermal ruptures.

Economy of Process Was Doubtful

Rails produced by this process were high in physical properties and impact resistance, but the estimated cost of equipment and operation to produce quenched and drawn rails was found to be excessive and the treatment did not appear economically practical except for especially severe service requirements. On the other hand, the controlled cooling process prevented interior ruptures but did not give the grain refinement which is necessary to resist impact stresses properly, especially at low temperatures.

The special normalizing process, however, did refine the grain structure and also prevented the formation of thermal ruptures or shatter cracks within the proper ranges of cooling, reheating and final cooling. Ranges for cooling, reheating and final cooling were studied and established. Even under drastic cooling, reheating and final cooling it was demonstrated that damage to the steel through stresses in the rail head was minor. The process could be regulated, therefore, so that the reduction of internal stresses would eliminate entirely thermal ruptures.

Rails manufactured by this process are not allowed to cool through the brittle ranges until they have been treated thermally and have obtained a refined grain structure which will resist cooling stresses without rupture. Photomicrographs on the next page illustrate effects of normalizing on grain structure. Further development of the process incorporated the hardening of the ends of the rails before the final cooling as an essential feature. This reduces the end batter which shortens the life of the rail in service and which causes wear on rolling stock. The air quenched section of the rail head is drawn out slightly by the heat of the rail so that there is no demarcation zone between the hardened and unhardened parts along which a split or fracture can take place in service. The entire process can be regulated automatically, thereby eliminating the human equation and giving a uniformly treated product.

Exhaustive tests have shown that the normalized rails markedly are superior to those manufactured in the usual manner. A large number of railroads have installed test tracks of rails produced by this method in an experimental furnace. These tracks are being observed closely and the wear and batter measured in comparison with hot bed cooled and, in a few cases, with slowly cooled rails. Results so far confirm the conclusions arrived at in the laboratory.

An interesting method was employed to determine the location and amount of internal stresses in rails. A section was machined and ground on the ends to give a uniform surface square to the longitudinal dimension of the rail. The rail head then was divided into a number of diamond-shaped sections and cut apart for a certain distance with a fine band saw run through a cooling medium so as to prevent heating of the steel. These cuts released the different

Ductility Tests on Normalized and Ordinary Rails

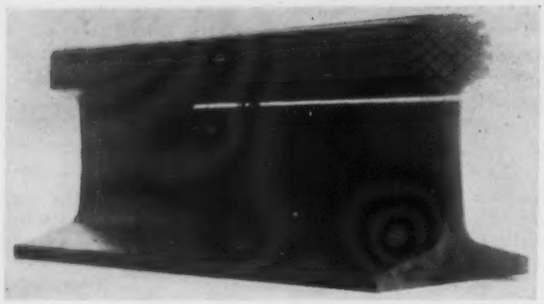
B Rail, Ingot 12, Heat No. 54031—Normalized

Specimen Number	No. of blows	Permanent set—inches	Per cent elongation per inch 1 in.	2 in.	3 in.	4 in.	5 in.	6 in.
1	1	0.80						
	2	1.35	8	8	7	6	5	5
	3	1.85						
	4	2.30						
	5	2.85	14	16	13	9	8	7
		Twisted—test discontinued						
2	1	0.80						
	2	1.40	5	7	8	7	6	6
	3	1.90						
	4	2.40						
	5	2.80	16	20	17	14	11	9
		Twisted—test discontinued						
3	1	0.75						
	2	1.35	5	6	7	7	7	5
	3	1.90						
	4	Broke	7	10	12	14	15	10
4	1	0.80						
	2	1.40	6	7	8	8	7	5
	3	1.95						
	4	2.35						
	5	2.90						
	6	3.40	13	16	16	11	10	9
		Twisted—test discontinued						
5	1	0.80						
	2	1.40	5	8	9	8	7	6
	3	1.90						
	4	2.40						
	5	Broke	8	9	12	15	16	12
6	1	0.80						
	2	1.35	5	7	7	6	5	4
	3	1.90						
	4	2.30						
	5	2.80						
	6	3.40	12	16	15	13	10	9
		Twisted—test discontinued						

B Rail, Ingot 13, Heat No. 54031—Cooled on Hot Bed

1	1	0.75						
	2	Broke	4	5	6	6	7	6
2	1	Broke	2	2	3	4	3	3
3	1	0.75						
	2	Broke	3	4	4	4	5	6
4	1	Broke	1	2	2	2	3	2
5	1	0.80						
	2	Broke	3	3	3	4	4	4
6	1	Broke	2	2	3	3	3	2

C. 0.73 Mn. 0.92 Phos. 0.034 Sul. 0.028 Sil. 0.23



Method of sawing the head of rails to determine internal stresses

pieces from each other and those sections, which had compression stresses, became elongated while those in tension were contracted.

Each individual part then was measured by a micrometer and a reading taken for the change in length resulting from the release of the stresses. The location and magnitude of these stresses then could be determined and plotted, with curves drawn through the points of equal stress. Accompanying diagrams illustrate the curves of equal stress in various rail heads as identified from test specimens.

Results of a sample test to determine the relative ductility of a normalized rail compared with one cooled on the hot bed are shown in the accompanying table. Each of these rails was cut into six pieces and tested head down in a standard drop testing machine with a drop of 22 feet. The table lists the number of blows required to twist or break the rails, the permanent set, and the percentage of elongation in each of 6 inches measured on the head of the rail.

This development in rail manufacturing comes at an opportune time. Speeds of both passenger and freight trains are increasing, and to meet this new condition it is essential that track material be of the highest quality if maintenance is to be reduced and failures eliminated.

Photomicrograph of nital-etched rail containing 0.82 per cent carbon in the "as-rolled" state. X100

Stout Forecasts Future Industry

MUCH greater change in motor cars in the next five years than we have witnessed in the last decade, is the prediction of William B. Stout, noted airplane and automobile designer. The same applies to machine tools and airplanes, in his opinion. We will have new lighting systems, new types of home equipment, new layout of cities, new methods of transportation and many things we do not dream of as yet.

In characteristic Stout manner and with the power of a clairvoyant, he painted his conception of future technology in words that held the attention of a large audience at the production dinner held Sept. 19 under direction of the Cleveland section of the Society of Automotive Engineers, during the National Machine Tool congress in Cleveland.

Machines Solve Problems

Progress, he said, has been expressed in words for many generations without action. We have theorized on human conduct and on the brotherhood of man and on the necessity of understanding other peoples, but theorizing, preaching and writing are not enough. As machines come into our lives they solve not only our business problems but also the moral problems of the world. If we now are in a great state of unrest nationally and internationally, it is because of the urge of a great change that is coming about. A new era is in the making; not a new deal in legislation. Laws are discovered, not made.

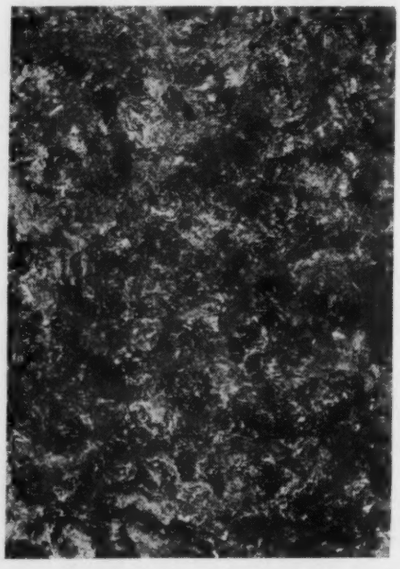
As we become more sound conscious we are going to insulate homes against noise. With refrigeration we are becoming temperature conscious. We dislike to be too hot in the summer. It was all right a while ago but then somebody invented air conditioning. One reason why houses and buildings are going to become obsolete so rapidly is because the present buildings cannot be air conditioned economically.

In design of machinery and particularly automobiles, we are gradually becoming weight conscious. The airplane has begun to show us how we can make things lighter and stronger. Because automobiles are going to change, perhaps with greater frequency or in greater amount, it will mean a more extensive change in tooling. It will mean a new type of tooling that will come to take the place of some of the most expensive dies. We may get a less expensive die that will not last so long or something of that type. More economics will go into the design of it because of obsolescence. That all comes through research, Mr. Stout said. Each individual business is changed. The railroads are changed. New ideas are coming to the fore as fast as restrictions will allow them.

At the conclusion of his discussion, Mr. Stout screened a movie film giving a resume of some of the research he has carried on in his Detroit laboratory. He has been concerned almost entirely with transportation developments.

Power Hedge Trimmer

An electrically operated hedge trimmer which cuts a 5-foot swath, thus placing hedge trimming in the volume production classification, has been developed by the Detco Mfg. Co., Oaks, Pa. The frame is of duralumin and the 5-foot cutting blade is of electric furnace steel. Cut steel gears are accurately machined and the bearing studs are of machined and polished steel. The company also manufactures electric and hand operated trimmers in smaller sizes.



Photomicrograph of nital-etched rail containing 0.82 per cent carbon after normalizing. X100

A group of members and guests who attended the eighteenth semiannual convention of the American Gear Manufacturers association at the General Brock hotel, Niagara Falls, Ont., Oct. 14-15

Improve Employer-Employe Relationships, American Gear Manufacturers Urge

STEADY improvement in business, shortage of skilled mechanics and the attempted undermining of workers' morale were three outstanding topics to which attention was directed at the eighteenth semiannual convention of the American Gear Manufacturers association held Oct. 14-15 at the General Brock hotel, Niagara Falls, Ont. Attendance at the meeting was smaller than usual, many manufacturers being unable to have large representation because of pressure of current work.

In line with the policy adopted by other industrial and engineering associations in recent years, a varied selection of technical, commercial and management papers was included in the program, interspersed with reports of progress by the chairmen of technical committees. The wide scope of the discussions at the meeting was indicative of the thinking of the industrialists present, and of the trend in the attitude of engineers who formerly took little interest in economic, business, social or labor discussions. Technical matters were not neglected, however, four papers being devoted to design, production, operation and lubrication of gearing.

Citing the termination of earlier depressions as examples of what we may expect in the near future, W. J. Donald, managing director, National Electrical Manufacturers' association, New York, pointed to the seven-year periods in the 1840's and 1870's when business was at about as low an ebb as during the period since 1929. He felt that one more year—even though it be a presidential year—will see us safely out of the woods and on the way to better times.

There will be in this recovery, Mr. Donald believes, a strong reaction against any form of regimentation, particularly because business men in general have become suspicious of government through recent legislative efforts. Furthermore, he is of the opinion that the "evangelical" aspects of NRA stamped it as a reform rather than a recovery measure, and that business is through with any form of evangelism or kindred prohibitive steps.

Adopt Voluntary Codes

Trade associations now are throwing the so-called "protective" measures into the discard and their member companies consequently are able to look into the future with clear and purposeful vision. Mr. Donald stated that as had been pointed out in the opening address of the meeting by A. A. Ross, General Electric Co., West Lynn, Mass., and president of the association, many of these member companies voluntarily adopted a code of fair practices for the industry after NRA was abolished, and today are following these collaborative rulings.

In commenting on Mr. Donald's address, S. L. Nicholson, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., claimed that business development, including research into the creation and sale of new products —on which the speaker had touched —should be accepted as a responsibility of the industry as a whole rather than the aim of individual companies. Thus would there be more solidarity of purpose between member companies. Similarly, it was brought out in further discussion, advertising and sales promotion campaigns could be sponsored to advantage by the industry working in collaboration.

Advantages accruing from the use of a uniform cost accounting system were stressed in a paper by H. N. Mathias, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., chairman of the committee handling the cost factors in business management. He called attention to the desirability of each member company adopting a standard system of compiling costs, thus placing them in a favorable position to compare their prices and determine wherein their operations might need revision if these prices were out of line.

A highly illuminating discussion followed, inspired by E. S. Sawtelle, vice president, Tool Steel Gear & Pinion Co., Cincinnati. To emphasize the need for some simple formula for estimating gear prices, Mr. Sawtelle asked members to mark up ballot slips stating their hourly rates used for estimating purposes and also the percentages they added to the sum of this rate plus

the material cost to cover commercial and selling expenses.

The ballot disclosed an average hourly rate of $1.81 and a commercial and selling expense of 28 per cent. The former figure varied from $1.55 to $2.00 and the latter from 18 to 45 per cent. This discrepancy was pointed out as unusual, but where the high figure was low for the hourly rate it was high on the same ballots for commercial and selling expense, and vice versa, thus bringing actual cost prices well in line.

Education of employes was the subject of an address made by H. H. Kerr, president, Boston Gear Works Inc., North Quincy, Mass., at the dinner meeting on Monday evening. At the outset, Mr. Kerr stated that in the present upward movement of business, we are confronted with a problem of where to get suitable men. "What are we doing to educate men to take up this shortage, and what program is industry adopting to prevent a repetition in the future?" he asked.

Large plants maintain apprentice training courses, but many shops are too small, or the nature of their work is such that they cannot do this and are obliged to go into the open market for trained operators. Such shops, asserted Mr. Kerr, should take an active interest in trade schools and help teaching staffs to formulate programs of benefit to the industries which will eventually absorb the students.

Apprentices and Learners

Some companies are criticized for commercializing apprentice labor to effect low competitive prices. In these instances, apprentices are not being trained as general mechanics, but as "learners" of one operation, and should be entitled to the general minimum wage for skilled workers after a few months, or as soon as they are proficient. A true apprenticeship plan trains the young mechanic to become proficient in multiple operations, while a "learner" is trained for one operation. The former trains future executives while the latter trains "learners" to remain machine operators.

Recently asked the question; "What do you consider an educated man?" Mr. Kerr answered: "One who can read intelligently, write legibly, figure accurately, and who has trained his mind and hand to produce something useful to society." Men of these qualifications may be obtained by one of the following methods:

1. Complete apprentice training courses, as carried out in the larger plants.

2. Trade schools where complete training programs are included. Co-operative schools where practical application is carried on by alternating periods between classroom and shops, the usual period being six weeks.

3. Training worthy, willing boys as learners in our own shops under foreman supervision, with a related subject course laid out for evening study.

In concluding his address, Mr. Kerr admonished that so much stress has been made on social security by the present administration that the opinion seems to be prevalent that work in the form of producing is not necessary. To overcome this influence, he advised: "Keep a greater interest in your employes, your largest as well as your most valuable investment, and give the boy and girl of today some of your personal time and interest to combat the teachings detrimental to your interests, which are all too prevalent at this time."

Critical Period Ahead

Spontaneous discussion followed this address and leaders of many of the largest gear manufacturing companies took part. General agreement was expressed on the fact that industry is facing a critical period in regard to employe relationships. A number of speakers emphasized the desirability of offsetting the current propaganda that is being spread by radical factions of labor through maintaining closer contact with workers and also workers' families.

In another address dealing with industrial relations problems, prepared by Louis Ruthenberg, president of Servel Inc., and ably presented Tuesday morning by F. H. Fowler, Foote Bros. Gear & Machine Co., in the absence of the author, emphasis again was placed on the insidious propaganda that is being disseminated. "If industrial disturbances bordering on chaos are to be avoided, management must compete intelligently and aggressively for the support and loyalty of our workmen," Mr. Ruthenberg claims. He feels that American industry must make rapid progress in this matter, and that the result can be accomplished steadily and without disruption of industrial activity if management will quickly adopt constructive measures.

Discussers of this paper included Seth Eberhardt, D. W. Diefendorf, A. G. Brown, and G. L. Morehead. Consensus of opinion was strongly in favor of creating and maintaining close personal contact with the shop men in the endeavor to build up efficient and co-operative morale.

Of the four technical papers, the most comprehensive and best received was "Factors Influencing the Durability of Automobile Spiral Bevel Gears" by J. O. Almen, General Motors Corp., Detroit. Mr. Almen touched on all phases of rear axle gearing from stress concentration, fatigue failure, and effect of carburization on strength, to pitting, scoring and finally, lubrication.

Because 90 per cent or more of tooth breakage in service can definitely be traced to fatigue, and the method of bearing mounting of gear shafts is primarily responsible, the author suggested that the straddle-type mounting be adopted wherever practicable. This has the effect, through greater rigidity in mounting, of reducing tooth deflection in service and gives more even distribution of tooth loading.

In connection with lubrication Mr. Almen believes that the use of E. P. lubricants is highly desirable for the more severe conditions of service, claiming that they reduce the tendency for scoring and wear. For more normal conditions he suggests the employment of mineral oil of as low a viscosity as practicable, up to the point where the lightness of the oil might promote leakage.

A. H. Candee, Gleason Works, Rochester, N. Y., in discussing this paper, disagreed with a claim made by the author that one-tooth contact should be taken as a basis for calculation. He agreed implicitly with the majority of Mr. Almen's statements, however, and commended the paper as one of the best ever presented at an A.G.M.A. meeting.

E. P. lubricants again came under consideration, in the discussion of the lubrication paper presented by J. L. Draper, chief lubrication engineer, Texas Co., Boston. While it was agreed that these lubricants filled a need for severe-duty steel gear drives, they should under no circumstances be employed for bronze worm gearing due to a detrimental chemical action on the metal.

Advoates Colloidal Graphite

Commenting on this same paper, Chester B. Hamilton Jr., president, Hamilton Gear & Machine Co., Toronto, Ont., spoke favorably of colloidal graphite for enclosed gear drives. He has found in practically all tests that colloidal graphite definitely increases load-carrying capacity.

Putting forward the thought that the designation of oils by trade name is confusing, R. S. Marthens, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., suggested the possibility of the standardization of oils under classifications that would be common to all refiners. It was contended, however, that this is impracticable due to the variety in grades and qualifications of oils being produced.

Comparisons between speed-increasing gears and speed-reducing gears were made in a paper by P. C. Day and W. P. Schmitter, Falk Corp., Milwaukee and presented by the latter. The authors contend that no essential difference exists in the de-

(*Please turn to Page* 61)

POWER DRIVES

Toolroom Drives

TRANSMISSION engineers differ in their opinions regarding whether group or individual drive is more advantageous and economical for the miscellaneous machine tools in the toolroom. The best solution in any case depends on the circumstances, with many engineers favoring individual drives especially where there are more machines than men at work, the men taking their work from machine to machine as necessary.

Recently an Eastern engineer offered and installed a different solution of a toolroom drive. Analysis of the drive problem showed that the ratio of installed, rated motor horsepower on individual drives would be about five times that required for a single group drive. As no more machines can be operated than men are employed, and it is unlikely that at any one time all would be working on the larger machine tools he decided that the group motor need be rated only large enough to drive the lineshaft plus the maximum machine load, which in this case required a 20-horsepower motor. A production department with similar machine tools probably would have required a 30 to 45-horsepower motor.

Important Cost Saving

The approximately 100 horsepower of individual motors would have cost probably at least four or five times as much as the single group motor. Usually the cost of mounting the motors, or the extra cost of machines built to take individual motors, exceeds the cost of the lineshaft installed. This, together with the extra cost of wiring and controls for the many small motors compared to that for a single motor, would have made an original investment on unit drives six or seven times as great as for the single group.

Since the annual fixed charges on the drives are a definite proportion of the original cost installed, this factor in the cost of operation would be at least several times as great for the unit installation.

Maintenance costs, especially when antifriction hanger bearings are installed, are considerably lower on group drives than on equivalent unit driven machines. Motor inspection, cleaning, oiling, and repairs then become the important items of maintenance expense. The cost of this is determined by the number and size of motors and the atmospheric and operating conditions under which they operate. Motors mounted on the machine or alongside on the floor are exposed to much more dirt and metal dust or turnings than when set overhead and so require more attention.

Assuming power costs to be approximately equal in either case (power factor penalties, if imposed, would increase the cost on the unit driven installation), the cost advantages in fixed charges and maintenance would be greatly in favor of the group driven installation.

If at any time in the future the management should decide to increase the number of men employed either a larger motor can be installed or a section of the shafting can be cut off and another smaller motor connected up to drive it.

♦ ♦ ♦

Variable Speed Pays

Boring mill operation is one type of work where variable speed transmission easily demonstrates its worth. For example, on facing operations on disks or on rim and hub finishing, classes of work which are very common on this machine, the machining time depends upon rotating the work table at the highest safe speed for the tool. This speed varies widely between the rim and the center.

Many operators neglect to stop and make the necessary speed changes by shifting belts or back-gears which at best provide only step-speed changes. The seriousness of this loss from the operator's carelessness is well illustrated by the experience of a midwestern concern. Merely by installing a variable speed drive which is controlled by means of a chain and sprocket convenient to the operator, the machining time was reduced 25 per cent on the type of work in production at that time.

Where a machine is operating continuously or for long periods on a single item speed control may be made automatic and thus at all times maintain the best cutting speed irrespective of the attention of the operator. This is especially important where he handles more than one machine.

♦ ♦ ♦

Clutch Service

Clutches receive the most severe operating service, often approaching abuse, of any mechanical power transmission equipment. Even the best unit, on many drives, is required to deliver to its full capacity. Because of the severity of service, such as picking up at full speed a heavy stationary load, careful consideration should be given to the type and size of clutch selected and installed on any job.

Modern clutches which are designed for high speed or heavy shock load service with antifriction bearings for radial and thrust loads, if properly rated according to the severity of the operating conditions they are to meet, will stand up. The clutch, even though usually one of the last pieces of transmission equipment to be considered in designing a drive, is a poor place to try to economize by under-rating the service or by over-rating the unit. The best clutch is the most economical—an axiom which is true in connection with the selection of any plant equipment where long life and uninterrupted service are essential.

♦ ♦ ♦

Self-Aligning Coupling

Where equipment expands during operation and contracts when idle, as in connection with much process work, self-aligning flexible couplings are practically a necessity for direct connecting the motor or, for that matter, connecting any two shafts in line. Under such varying conditions of operation maintaining shaft alignment is practically impossible.

Recently a new self-adjusting coupling has been developed, especially designed to compensate for both parallel and angular misalignment, according to the manufacturer, who states that the coupling has operated without appreciable wear with parallel misalignment of as much as 5/16-inch and with angular misalignment of 3 to 6 degrees. The unit is noiseless and is said to reduce power losses.

This coupling is of the hub and projecting pin type with a slotted drive disk loosely fitted into the pins which permits self adjustment in operation. The coupling is enclosed within a metal housing for safety. While originally designed for use in the food and chemical industries its advantages are applicable to many other drives where the driven machine is exposed to expansion or contraction in operation.

METHODS AND MATERIALS

Oxyacetylene Hazards Detailed

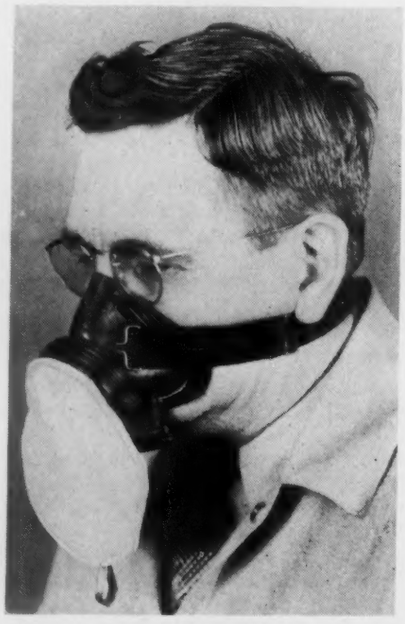
OXYACETYLENE safety literature is chiefly concerned with the care of oxygen and acetylene cylinders, hose, pressure regulators and torches; setting up apparatus, turning on the gases, adjusting pressures, lighting the torch, adjusting the flame, shutting down, and other matters that pertain to the apparatus itself, according to F. E. Rogers, Air Reduction Sales Co., 60 East Forty-second street, New York.

More attention must be given in such safety literature to what should be avoid d and guarded against in the work pieces as distinguished from the apparatus. For example, no cutting should ever be done on empty barrels, tanks or other containers that have held tar, linseed oil, alcohol, lubricating oil, gasoline, kerosene or any other combustible liquid without first purging with live steam, or filling with water and doing the cutting at the top over the water line; filling with an inert gas such as carbon dioxide or nitrogen. By the same token this rule should rigidly apply also to riveting, oxyacetylene welding, arc welding or any process that introduces flame or ignition temperature within the vessel in question. Air-and-gas mixtures in explosive ratios are highly destructive, comparing in capacity to destroy life and property with dynamite.

Cored castings when preheated for welding or other operation during high temperature present a double hazard if not ventilated and purged. The water or oil contained in a sealed cavity may expand and develop a bursting pressure, or through ignition of a mixture of air and gas produce an explosion that rends the casting into pieces, and scatters death and destruction in their wake.

Safety precautions in the oxyacetylene field, says Mr. Rogers, should comprise not only observation of the usual rules with respect to gases and welding and cutting apparatus but also of all hazards that might be set up with fire and heat in the work pieces themselves or contiguous to them. He advocates a broad vision on the consequences of careless or ill-considered procedure. Keep especially in mind, he says, the fire hazard from sparks falling into combustible and explosive materials nearby, or beneath on another floor.

Approved for Lead Dust



BAG TYPE RESPIRATOR shown in this illustration has been approved by United States bureau of mines for protecting workmen against inhalation of lead dust. Developed by Willson Products Inc., Reading, Pa., it is intended for general use in dust laden atmospheres

\$ \$ \$

Devises Own Electrically Heated Tempering Bath

Tempering of dies and other machine parts is a process which requires accurate temperature control. To obtain the advantages of electric heat for tempering, one manufacturer in the Middle West built a small salt bath tank and equipped it with electric strip heaters for furnishing the required heat.

Inside dimensions of the tank are 20 inches long, 10 inches wide and 15 inches deep. Six 18-inch embedded-type strip heaters were tightly clamped to the bottom of the tank, these providing a metal to metal contact which insures the best and most economical heating. Temperature is controlled by a 3-heat switch which makes possible 450 or 500 degrees Fahr. temperatures, whichever is required by the materials to be tempered.

Use of electric heat for this tank enabled the manufacturer to eliminate fire hazard and objectionable fumes, and at the same time made possible a simple and accurate temperature control.

\$ \$ \$

New Chemical Makes Paint Adhere to Galvanizing

To overcome the difficulty encountered in making paint adhere to galvanized surfaces, the American Chemical Paint Co., Ambler, Pa., has developed a chemical coating, which, when applied to the surface, provides a suitable paint base. Known as "Lithoform," the chemical is said to provide a coating which will not wash

CINCINNATI . . . recommends and uses SUNOCO!

—like many other well-known machine tool manufacturers

CINCINNATI Milling Machine and Cincinnati Grinders, Inc.,—as well as many other prominent machine tool manufacturers—realize that more pieces per tool grind, more satisfactory work, increased production and lower cutting cost are direct benefits of the lubricating and cooling effect produced by Sunoco.

Faster, better grinding and more grinding per abrasive unit, with less time out for replacing and resetting grinding wheels, are all made possible by the use of Sunoco.

In Your Shop

On performance and performance alone Sunoco has won recognition wherever machine tools are operated.

In your shop under your own operating conditions Sunoco will amply demonstrate its value as an aid in establishing new and higher standards of machine tool efficiency.

SUNOCO
EMULSIFYING
CUTTING OIL

Cincinnati 5-48 Plain Hydromatic Milling Machine

Lubricant: 1 part Sunoco Emulsifying Cutting Oil to 20 parts Water.

Cincinnati No. 2 Centerless Grinder—

Coolant: 1 part Sunoco Emulsifying Cutting Oil to 40 parts Water.

SUN OIL COMPANY, PHILADELPHIA *Subsidiary Companies:* Sun Oil Co., Ltd., Montreal
British Sun Oil Co., Ltd., London, England

off, will not chip, will not corrode in the weather, and is not affected by baking temperatures.

The new chemical is applied by brushing or by spraying. The surface is first cleaned and then lightly scoured with fine steel wool. Following the lithorizing treatment, the surface is washed and dried and is ready for painting. It is stated that lithorized surfaces will not react with the atmosphere, therefore, it is not necessary that they be painted immediately.

Paint will not adhere to galvanized surfaces, research is said to have shown, because the zinc oxides and carbonates formed on the surface by reaction with the atmosphere combined with the oil in paint to form an insoluble, inelastic zinc soap. It is this soap layer between the metal and pigment which cracks and causes the paint to peel. By purely chemical action, the new treatment is claimed to form an impervious stone-like coating on the metal, this coating preventing the formation of zinc soaps and providing a good bond with the paint.

The chemical is designed to cover 1,000 square feet of surface per gallon. It is available in quart and gallon bottles and in 5 and 12-gallon carboys.

Restyled Tack Cartons Attract

AS A part of a complete merchandising campaign covering its Grand Crossing line of cut tacks and small cut nails, the Republic Steel Corp., Youngstown, O., is marketing these products in attractive new packages.

Shown in the accompanying illustrations, they were designed by the G. M. Basford Co., New York and Pittsburgh, as a result of a study conducted by W. S. Leech, vice president of that company, preparatory to the creating of a bright new catalog of these products.

At that time Republic was using 19 different sizes of packages because some tacks bulk larger than others and tacks are sold by weight. On considering the application of color to all of these cartons it became apparent that the cost of so many color plates would be prohibitive. Mr. Leech then observed the weights of the different types of tacks made at the Grand Crossing plant and after some experimenting was able to replace the 19 sizes of cartons with six that would answer all requirements.

Display Value Enhanced

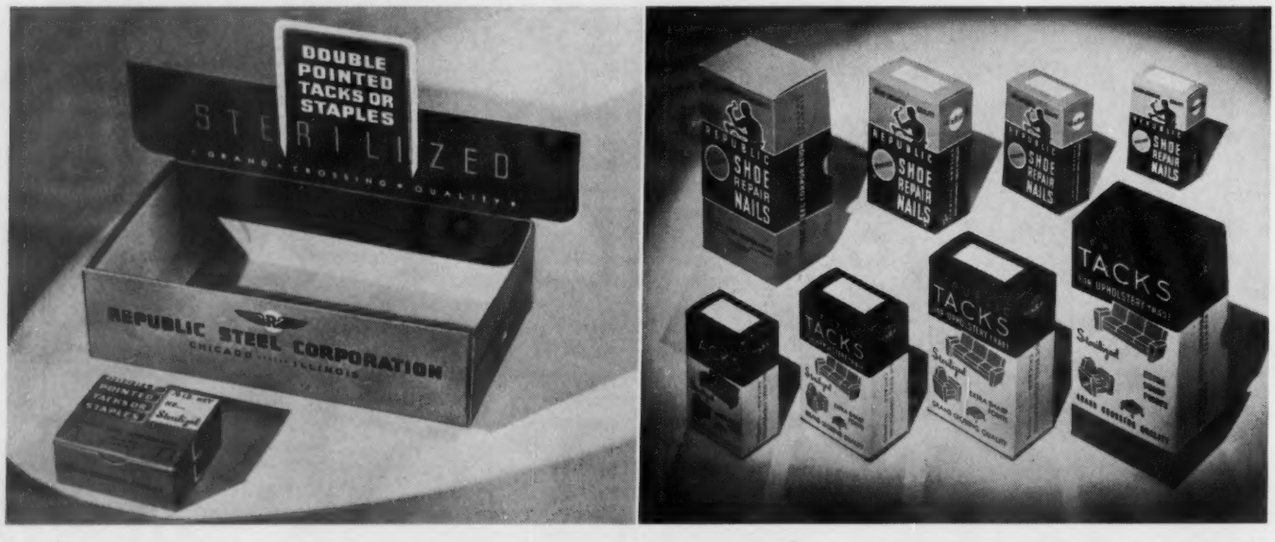
Formerly the cartons were finished unattractively in drab mist gray and black. On the new packages a modified peacock blue has been used with black on a white background. Captions and labels have been laid out with care so as to combine attractiveness with legibility, enabling the retail dealer easily to identify each package. This facilitates the filling of customer's orders and the replenishing of stock. The new cartons also effectively lend themselves to counter and window display. Color combination on these cartons is used by Republic in all its advertising and literature covering these products, thus establishing an identification which appears to be proving helpful in merchandising.

These new packages have been on the market for only a short time but conclusions have already been reached as to their eventual effect on sales. Republic knows that since their adoption quite a few customers have voiced their approval by placing more orders for these goods.

Materials Aid In Redesign

AN INTERESTING problem in redesign recently was worked out in connection with a new thermostat for room temperature control manufactured by Minneapolis-Honeywell Regulator Co., Minneapolis. At the left, in the illustration on Page 42, is shown a model of the new thermostat as developed by the company's engineers with consideration for its functional features only. This model was placed in the hands of Henry Dreyfuss, industrial designer, New York, who endowed the new thermostat with eye appeal. The two photographs are not on the same scale; in reality the redesigned unit is smaller than the working model shown at the left.

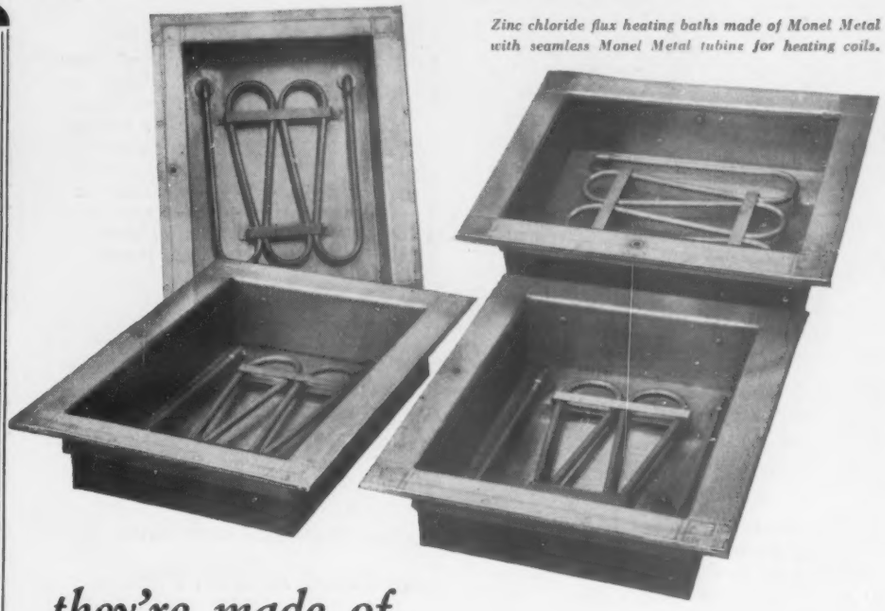
Many elements of the design have been made possible by the advancement in the manufacture of raw materials. The case of the instrument, a problem in difficult forming, is made from cold rolled strip steel. The coil mounting brackets, contact post brackets and the mounting base also are of strip steel. Various binding post brackets and the housing



Photos courtesy Modern Packaging

In redesigning Republic's tack cartons it proved possible to reduce from 19 to 6 the number of sizes required. The use of color and careful arrangement of captions and labels resulted in the creation of packages which are easily identified and which lend themselves effectively to counter and window display

Heating Baths for ZINC CHLORIDE Soldering Flux still like *NEW* after *3¾ YEARS*



Zinc chloride flux heating baths made of Monel Metal with seamless Monel Metal tubing for heating coils.

they're made of

MONEL METAL

● It all happened in the radiator department of a prominent automobile plant.

Prior to tinning, they dip the radiator-cores in a soldering flux consisting of 88% zinc chloride and 12% ammonium chloride. This flux is kept at a temperature of 90° F. (and for a time was held at 153° F.).

No sooner would they get rigged out with new baths for heating this flux than the Supt. would hear that they needed new ones.

"Those tanks just can't take it," thought the Supt. "And we're going to keep trying until we find a material that *can*."

He did... and how! After experimenting first with this material and then that, he tried MONEL METAL.

And immediately production hold-ups... to say nothing of the expense... came suddenly to a stop.

Here's proof. The first Monel Metal bath was put into service in January, 1932, and now after 45 months of continuous service, they write "...apart from discoloration, the baths have not suffered in any way, and are as good as when we purchased them."

Although the department layout has since been redesigned, the baths have been re-installed.

So satisfactory have these Monel Metal flux heaters proved, that in 1934, this plant installed additional equipment of Monel Metal.

Write for data giving the corrosion-resistant properties of Monel Metal, and our new 24-page publication, "Equipment Designs for the Pickle House."

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York, N. Y.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

News Flashes

Wire-Wound Wood Pipe

Michigan Pipe Company recently supplied to a large steel mill 700 ft. of 12" x 3" shell, wood-stave pipe spirally wound with No. 4 B&S Monel Metal wire, for conveying waste acid from their pickle house. Acid consists of 1 to 7% sulphuric (a small muriatic content at times), water, iron sulfate and small quantities of sand and steel scale. The pipe is covered with a heavy asphalt and sawdust coating and is installed in earth under a concrete floor. The total load on the pipe is about 1500 lbs. per sq. ft.

• • •

Sand Blasting

When the Symington Company, Rochester, New York, found that ordinary steel baffle plates in sand blast tumbling-barrels lasted on the average of only five weeks, they experimented with plates made of "Ni-Hard," a wear-resistant Nickel-Chromium Cast Iron. Examined at the end of fourteen weeks, the "Ni-Hard" baffles showed no measurable wear.

• • •

On the Track

Worn railroad track is being built up and repaired by welding, using a special steel welding rod containing manganese and Nickel.

• • •

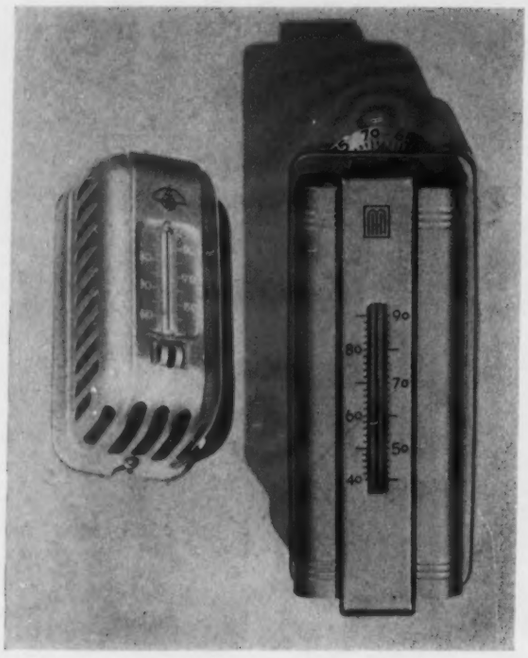
Reclaiming Lube Oil

A Monel Metal condenser coil manufactured by the Osterloo Manufacturing Company for use in reconditioning used lubricating oil, has been in service for 7 months and is still fit for much longer use. The distillate that comes off the oil at 650° F. is condensed in the water-cooled coil. Steel coils, previously used, lasted about 15 days.

• • •

Turbine Valve Cages of "S" Monel Metal

In November, 1933, a pair of centrifugally cast S-Monel Steam turbine valve cages were installed in the power plant of the Stehli Silk Company, High Point, N. C. After 14 months of service, they were found to be in perfect condition.



Working model of new thermostat is shown at left while at right is the new product after eye appeal has been incorporated in it. The photographs are not on the same scale; actually the redesigned unit (right) is smaller than the engineering model

for the heating element are of brass. The dial tension spring, which is integral with the pointer, is of nickel silver. The element spring and contacts posts are of phosphor-bronze, while the contacts themselves are platinum-iridium. Various supports which must be non-conductors of electricity are of bakelite rod and the rear mounting panel is of fabric base laminated bakelite. Molded bakelite has enabled the company to deviate from the conventional for the base and adjustment cam. The actuating element of the instrument is of thermostatic bimetal.

Simplified by Fewer Parts

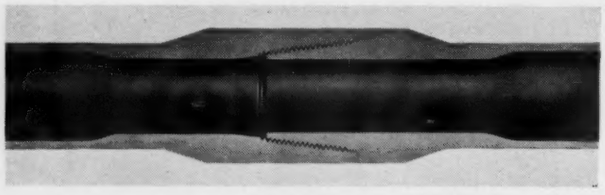
Judicious use of the correct raw material for each individual part has enabled the company to reduce the number of separate pieces to a minimum and materially add to the simplicity of the device. Its operation is accurate and adjustment is easy.

In working out the problem every effort was put forth to make the thermostat appear small and to make it harmonize with any type of decorative scheme. A central panel and a stepped-out back panel aided in breaking the mass. Top and bottom ventilation proved more efficient from an engineering standpoint than previous side ventilation and worked in more effectively with the desired appearance. The setting wheel was placed at the top of the instrument instead of at the bottom as on the previous model. Numeral and thermometer markings were simplified to facilitate legibility. By employing a neutral lacquer a metallic finish has been procured that does not chip or scratch easily and is sufficiently neutral to harmonize with any color scheme.

Conventional Tool Joint Is Eliminated in Drill Pipe

A new drill pipe of advanced design has been added to the line of oil country tubular products of the Jones & Laughlin Steel Corp., Pittsburgh. Known as the J & L, Integral-Joint, Blue Ribbon, seamless, drill pipe, it eliminates the use of the conventional tool joint.

In manufacturing, the end of the drill pipe first is upset to a tool joint shape. The drill pipe, not yet threaded, is heat treated to produce the desired physical properties. Then a tool joint thread is cut on the upset end, thus providing a tool joint integral with the pipe itself. Because threaded joints between drill pipe and tool joint are a frequent and dangerous source of twist-offs, states the company, the elimination of a large proportion of these threaded joints will mean fewer failures, resulting in lower costs and increased drilling speed.



Upset ends of new drill pipe have sufficient stock to permit two rethreadings

Another feature is the smooth easy change of diameter of the interior, which is described as being streamlined, thus reducing turbulence and giving increased mud velocity. Box and pin threads have both the hardness and wearing qualities of the best tool joints; there is sufficient stock in the upset of both box and pin ends for two complete rethreadings, and, since no heat treatment is required, this rethreading can be done by any shop equipped to cut a good thread.

The new drill pipe is announced following extensive field tests over the past year during which it has been used successfully in drilling many thousands of feet of hole.

Precautions in Machining Zinc Alloy Die Castings

Machining of zinc alloy die castings has never proved particularly bothersome but there have always been certain precautions, certain slight variations in practice advocated by the company, says the New Jersey Zinc Co., New York, in *Zinc Alloy Pot*. In orto verify this practice, letters were sent to several men whose varied experience with die castings should qualify them as advisers.

Concerning lathe and boring machine tools these men agreed that a good grade of high speed steel was satisfactory for almost everything they encountered. Occasionally on very high production jobs or where extreme accuracy was required a cemented tungsten carbide tool was justified. A rake between 15 and 20 degrees is unanimously satisfactory. The cutting angle ranged between 62 and 69 degrees, although one man has used an 82 degree cutting angle. Clearance angles range from 5 to 8 degrees to 10 degrees or even 20 degrees for high speed operations.

Milling cutters of high speed steel seem to be satisfactory with angles approximately the same as for working brass. One correspondent, however, advised "considerable rake on the cutting edge."

Ground high speed steel taps seem to be most generally used although for less than ¼-diameter plain carbon tool steel taps have proved practical for at least one of these men. For diameters of less than 5/16-inch two fluted taps are generally used, while for larger diameters three and four flutes gain a maximum tap bearing and a resultant smoother thread.

Drills of regular carbon tool steel are generally satisfactory although for large diameters, high speed steel tools are sometimes desirable. Plenty

ADVERTISING PAGES REMOVED

of clearance seems important and in cases of deep drilling or extremely rapid operations a polished flute helps prevent clogging with chips. A stationary, stable spindle without end play in the thrust bearing seems important to prevent gouging when the drill breaks through the work.

Two recommendations for a lubricant were made: A—3 parts mineral oil, 2 parts kerosene; B—"a fuel oil of the type known as 32-36 furnace oil."

What's the Matter With Us Answered by Brookings

Income and Economic Progress, by Harold G. Moulton; cloth, 191 pages, 5¼ x 8 inches; published by the Brookings Institution, Washington; supplied by STEEL, Cleveland, for $2, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This volume is the last of four studies devoted to an analysis of the distribution of wealth and income in relation to economic progress. The preceding volumes are, *America's Capacity to Produce*, *America's Capacity to Consume* and *Formation of Capital*. Another volume is projected for later publication, entitled *Readjustments and Recovery*.

The present volume draws together the lines of analysis developed in the other three into a positive statement of national economic policy designed to bring about a better distribution of the national income and therefore a more rapid and steadily maintained rate of economic progress.

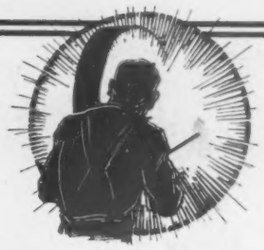
Sauveur on Metallography, Heat Treating, Revised

Metallography and Heat Treatment of Iron and Steel, by Albert Sauveur, fourth edition; cloth, 550 pages, 7¼ x 10½, 475 illustrations; published by McGraw-Hill Book Co. Inc., New York; supplied by STEEL, Cleveland, for $8, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

A fourth edition of this work, the first edition appearing in 1916, brings each chapter up to date, contains much new information and covers latest developments.

Two new chapters have been added, one on metallic crystals and their atomic structures, dealing with the fundamentals of the X-ray diffraction analysis of metals. Another deals with the author's view in regard to the hardening of steel and the constituents of iron-carbon alloys. An important chapter has to do with the occurrence, causes and effects of thermal critical points.

WELDING, et cetera . . .



BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

A Safe Bet

DEADWEIGHT is the enemy of transportation; but it is an enemy that is being conquered. Railroad men of 20 years ago made every part of a locomotive or freight car thick and heavy, as compared with modern engineering practice, and for good and sufficient reasons. First, the materials had no such physical properties as materials used today. Second, defects were present in the materials which were unknown as to degree or location and it was sound engineering to use a safety factor of anything up to 20 to 1.

Butt welded rolled metal is the answer to most weight reduction problems. Rolled metal, whether it be carbon steel, alloy steel, or nonferrous, is practically free from defects which require allowance in the safety factor. The butt weld has high strength for its weight.

The present day diesel engines made of low-alloy rolled steel details welded together represent practical application of these facts. The airplane fuselage, latest motor truck bodies, high-speed trains, automobile bodies, are additional examples of materials welded for weight reductions.

Somewhere near 0.001 per cent of the economies possible with welded rolled steel have been achieved. The top flights in both the steel industry and the welding industry are investing heavily on this proposition. It is a better bet than any stock market setup ever devised.

Stress Relieving

The first time mechanical loading is applied to a welded structure in the "as welded" condition, deformation will occur in a manner which is determined by the degree and location of residual stresses left by the welding operation. If this first mechanical loading is carried up to within possibly 5000 pounds per square inch of the normal yield point of the most heavily stressed member, and then the structure is allowed to "rest" or age, subsequent applications of mechanical loading will produce proportional deformation up to the value of the stress to which the metal was carried in the initial loading. This procedure is sometimes called mechanical stress relieving.

Steel Mistreaters?

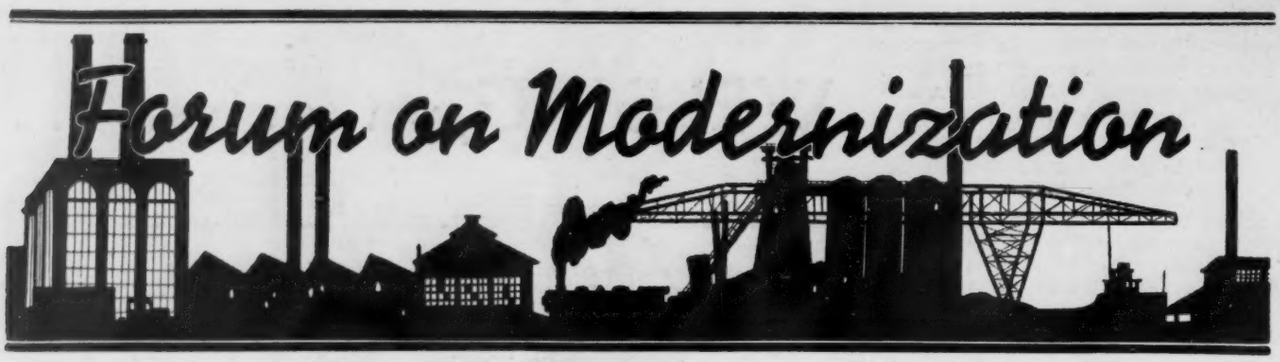
Steel treaters often call welders steel mistreaters—with good reason. Heating metal to a molten state locally and cooling it more rapidly than if it were quenched in water is metallurgical abuse in the mind of the steel treater. Yet, many of the high alloys are welded successfully. The problems are solved by application of the knowledge developed by the steel treaters and applied to the peculiar conditions of welding operations.

Sparks and Flashes

A steel mill in the Chicago district employs more than 100 welders on maintenance work. A plate fabricator in the same district owns 175 are welders, most of which are shipped from job to job all over the country.

* * *

The British are the world's champion discussers of welding. The records of British technical meetings on welding are good reading matter. Over there, everyone in a technical meeting is treated as a gentleman. One may blast the ears off the speaker or another commentator but it is done with dignity and distinction. Yet the British are doing more and better welding.



Plant Improvements Offer Definite Assistance to Profitmaking

BY GEN. T. S. HAMMOND
President, Whiting Corp., Harvey, Ill.

MODERNIZATION is not a fad. It is a very vital issue in the manufacturing field today. For some time the business press has been urging capital goods producers to modernize; yet the fact remains that many manufacturers of steel and iron products are trying to "get by" with obsolete and worn-out equipment.

On the other hand a number of the more progressive ones have seen the significance of modernization and are proceeding with definite programs running into millions of dollars. Some of these are already completed and bringing in returns to the stockholders. A large measure of the general improvement in the heavy industries is the result of this movement. Already these farseeing ones are cashing in on their investments by turning out better products at lower costs. Obviously they are better able to meet competition and secure a larger share of the available business.

Research Hastens Obsolescence

Due to research and development work carried on during the past five years along all technical lines, there is today available an extensive list of new and improved plant equipment and machinery. New methods and new inventions have made obsolete equipment that is still perfectly capable of operation but which the plant owner would do better to scrap because the newer models will operate so much more economically. Through increased speed one new machine may do the work of two or more of the old models.

Any factor which vitally affects cost of operation should receive the most careful consideration of management. Particularly is this true in the steel and ironworking trades, where cost of maintenance and operations runs into large figures. In many instances machines that have long since been written off through depreciation are still retained in a vain attempt to hold down expenses. In such cases the true economy lies in spending money for new equipment rather than trying to get along with the old.

Now is the time for action! Too long has management held back in fear from putting its house in order. The noticeable general improvement in industry is, we hope, but the beginning of a happier era of industrial development. As activity increases, prices will rise—it will cost less to modernize now than later on.

Opportunities for Modernization

Of the many opportunities for modernizing in the iron and steel field, one of the most outstanding is in the power plant. Great progress has been made in steam generating machinery, including boilers and auxiliary equipment, stokers, pulverized coal firing equipment, recording instruments and the like. Both stokers and pulverized coal equipment have greatly lowered the cost of steam production. Savings on these items alone are frequently sufficient to pay for the investment inside of two years.

Material-handling equipment is another important factor common to all types of plants. A large percentage of the cost of producing heavy machinery arises in handling operations. Worthwhile savings are possible through the installation of modern overhead traveling cranes, conveyors and hoists. The newer designs not only speed up handling of materials in process, but cut down maintenance expense as well. In our own business we have come across in-

Administration Alchemists Menace Industrial Security

BY CHARLES A. MOORE
Chairman of the Board, Manning, Maxwell & Moore Inc., New York

THERE appears to be undue optimism in the durable goods industries. Although every indication points to a great amount of business for these industries, I cannot see how any substantial realization of this possible business can occur with the menace of the present administration hanging over industrial America.

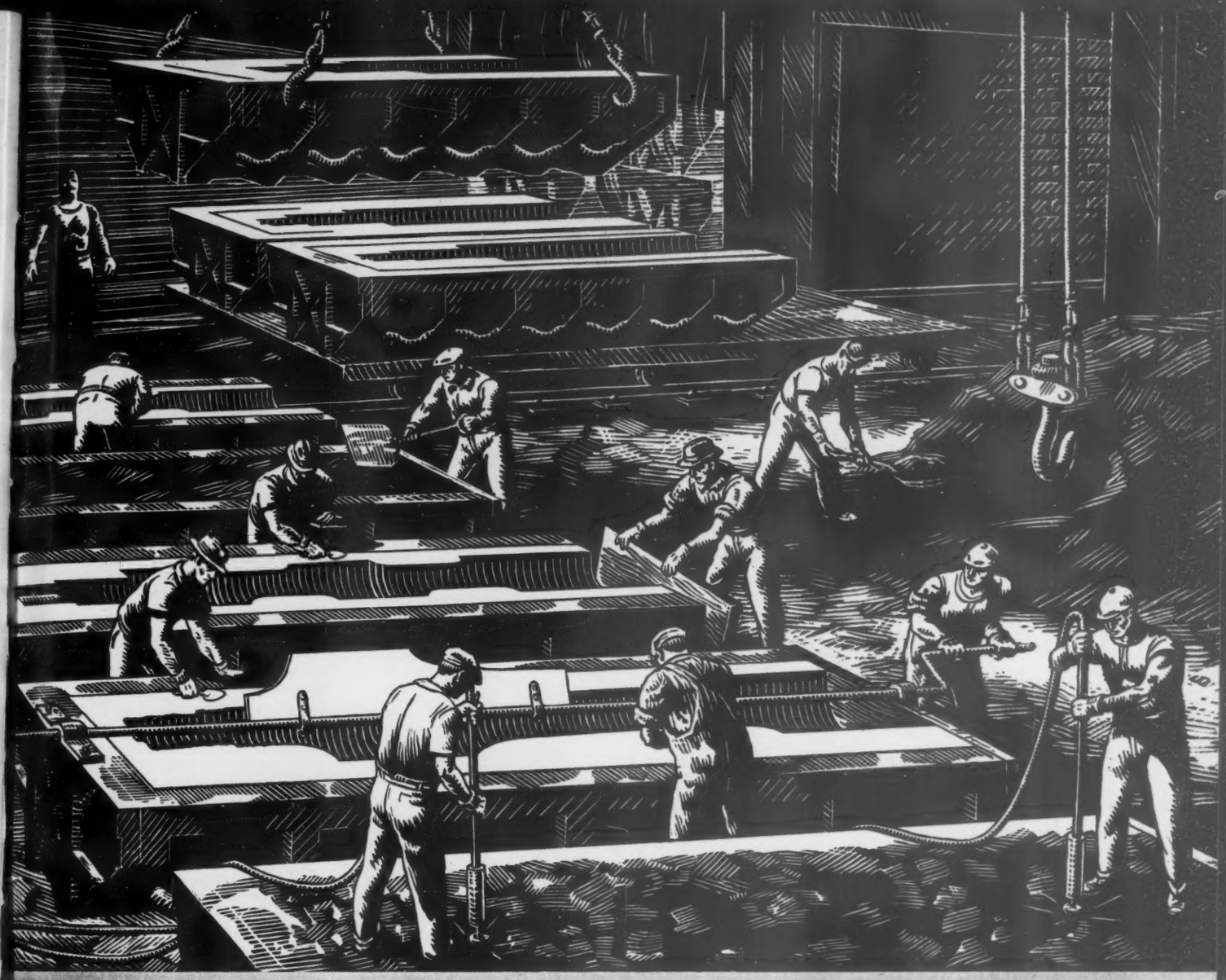
The prime requisite for substantial durable goods purchases is reasonable security. This is impossible so long as a medieval alchemist is continually experimenting with this nation to create for himself an elixir of political life.

Manufacturers of durable goods are deluding themselves with dreams of permanent recovery for their businesses while the certainty of uncertainty in which we have been existing for three years promises to go on.

The termination of governmental experimenting alone can bring to fulfillment the great promise of recovery in the heavy industries.

As soon as employers and employes alike realize that security is needful for prosperity we will get it.

Even guinea pigs cannot increase and multiply while they are being made the subjects of experiments.



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PHOENIX ROLLS

PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. PHOENIX CHILL; PHOENIX NICKEL CHILL; for all flat rolling requiring finish. Also tube mill rolls of quality material best suited to the kind of service required.

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stances where operating and repair costs on the old equipment more than paid for the new inside of a year. Noteworthy savings have been effected in foundries through the installation of overhead traveling cranes for unloading and storing raw materials as well as by special charging cranes for mechanically charging cupolas and furnaces.

Application of pulverized coal firing to annealing ovens illustrates another phase of modernization—the saving of time. Through the development of a special oven fired by pulverized coal, the annealing cycle in malleable foundries has been reduced approximately 50 per cent, to say nothing of the saving in cost.

Great progress has been made in the last five years in metallurgical practice. New types of furnaces recently introduced are setting new standards of quality and economy in the foundry field. Developments of this kind have raised the engineering properties of castings and enabled foundries to compete better with other types of construction, particularly in the automotive field.

More stringent requirements of health and sanitation have brought dust prevention and dust-collecting machinery to the fore. In this field recently introduced equipment offers a decided opportunity for modernization in practically all plants.

In nearly every branch of manufacturing activity there is ample room for modernization. Alert executives are seizing this opportunity to better their methods and are making use in many cases of the credit now available to industry under the Federal Housing Act. I do not think I am overstating the case in saying that modernization and profits go hand in hand.

Financial Managements Should Adopt Sound Equipment Buying Policies

BY S. OWEN LIVINGSTON
Vice President, Gallmeyer & Livingston Co.,
Grand Rapids, Mich.

TWO interesting incidents came to the writer's notice during the Machine Tool Show in Cleveland and are worthy of receiving attention and careful thought on the part of the chief executives, in charge of financial policy, of any company using machinery.

The first concerned the president of a manufacturing company with several large plants in the Central West. He had a feeling the Machine Tool Show was a place for a good time, and he was disinclined to have any considerable number of his operating personnel attend the show. It took considerable urging to get him to agree to attend personally the preview on the day before the show opened, but he came in early Tuesday morning and spent a half day seeing what was to be shown. At noon he went to a telephone booth, called up his headquarters and gave positive instructions that an extensive list of department heads and plant operating officials should take in the show, many of them being absolutely ordered to spend the full ten days looking over modern equipment. This man had suddenly awakened.

The other incident involved the president of a nationally known concern, who happened to be acquainted personally with the chief executive of one of the machine tool building companies. When he was passing through he stepped into the booth to pass a few personal pleasantries and comments. The machine tool builder, taking advantage of personal acquaintance and an intimate knowledge of conditions in the plant of his guest, called attention to the fact that failure to install some of this modern equipment was costing the corporation, of which this guest was the head, a considerable sum of money.

Seeing the Light

The executive attempted to turn it off in a jocular manner by saying, "What is the matter with your sales force, why don't they do a better job of selling?" The machine tool builder promptly answered that when their salesmen contacted this nationally known company they were referred to plant executives further down the line. These plant executives readily admitted the superiority of modern equipment and its profit-earning possibilities, but gave the answer, "The management would have a fit if we wanted to spend money for new equipment at the present time." The president saw the point at once; his jocular manner vanished and he replied, "Well, I want to say that from now on, after what I have seen here, the management is going to have a fit if they don't ask for modern equipment."

These two instances should be analyzed not only by those who attended the Machine Tool Show but by the managements of all plants using machinery. They should realize that, while they are ordinarily too engrossed with more important matters to interview salesmen of equipment, and this must be delegated to subordinates who are in intimate touch with the particular needs in their particular plants, there is a distinct responsibility on the part of management to see that these understudies are given the right point of view as to the attitude they should assume in regard to the purchase of new equipment.

Spend Money To Make Money

Too many times the plant executives, who make the actual contacts with salesmen, say that they cannot afford to make any purchases at the present time because they are not making any money, when probably the reason they are not making money is because they are trying to get along with obsolete equipment. Whether this is a mistake in policy on the part of management, or a mistake in interpreting the policy on the part of the subordinates, the responsibility, in either case, comes directly back to primary management.

Only those managers who have reached their executive positions by the route that leads through the manufacturing end of the business and are thus in a position personally to appraise intelligently the advances made in the past few years, and who attended the Machine Tool Show, can have any adequate appreciation of relative production possibilities of modern tools in comparison with those which were modern five years ago, to say nothing of the fantastic comparison that would be revealed where modern tools are compared with those over ten years of age.

Management that has reached its present position through the sales or financial department has the responsibility of selecting operating executives whose training and experience will enable them to make intelligent appraisals of the profit-earning possibilities of modern equipment and the further responsibilities of insisting that these operating plant officials investigate the profit-producing opportunities that new equipment makes available and of providing the funds for the purchase of such equipment.

Responsible management must

(*Please turn to Page* 67)

Industry Is Becoming More Safety Minded

Discussions at National Safety Congress Indicate Greater Efforts Are Being Made To Safeguard Life and Health of Workmen

INDUSTRIAL safety continues to grow in importance with company executives and engineers co-operating more intensively in eliminating hazards presented by plant operations and production machinery. Last week, Oct. 14-18, several thousand persons interested in these problems gathered in Louisville, Ky., at the twenty-fourth annual safety congress and exposition of the National Safety council. Because of this large attendance and a multiplicity of technical sessions, activities were divided between three hotels, the Brown, the Kentucky and the Seelbach.

No industrial safety program can succeed unless there is a wholehearted co-operation through the entire organization, according to J. Russell Craig, safety director, Pennsylvania Indemnity Corp., Philadelphia, who spoke before the metals section. In accident prevention, as in all industrial relations, one of the chief factors to consider is the relation between management and men.

As other important factors, Mr. Craig named complete physical examinations for employes; printed safety rules and firm insistence upon compliance with them; alertness to the accident problem on the part of the supervisory force and a complete understanding by foremen of the safety rules which the employes are expected to observe; an active organization to promote safety work; stimulation of individuals to promote safety activity; training of foremen and supervisors in the principles of safety and the methods of teaching it.

Recommends Safety Letter

One of the methods suggested by the speaker for stimulating interest of individuals was the safety letter, this being a composite letter compiled from safety notes suggested by several supervisors. Another worth-while plan is the safety observer system. Each foreman appoints one man for every 20 in his crew to act as a safety observer for a period of two weeks. These men become special pupils of the foreman in safety work. The observer reports dangerous practices directly to the offender, and not to the foreman. By rotating the observers, the foreman can give all his men individualized safety training, the speaker said.

Although the steel industry handles an enormous amount of gas annually, it has minimized serious accidents by eliminating the hazards. This has been done not by following some elaborate set of rules for safe handling of gas, but rather by guarding against two unsafe practices, according to George T. Williams, superintendent of blast furnaces and coke plant, Youngstown Sheet & Tube Co., East Chicago, Ind.

The two dangers, Mr. Williams said, are first, permitting the accidental or unknown mixing of gas and air, and second, permitting men to enter an atmosphere without first testing it for gaseous content. Accidents caused by gas are rarely slight, Mr. Williams pointed out. Those caused by inhalations or by explosions are very often fatal and may even be catastrophic.

Guard Against Ignition

Air and gas, mixed together at safe pressures, are harmless unless a source of ignition is provided. Therefore, sparks, static electricity, arcs, and other combustion agents are closely guarded in the steel industry. To prevent mixing of air and gas, thereby minimizing danger of explosion when clearing equipment of gas, steam or inert gases are generally used to act as a blanket or cushion between the two elements.

The steel industry guards against toxic poisoning of its employes by testing samples of air in places where work is to be done, by providing safety masks, and by use of safety belts, Mr. Williams said. He added that on hazardous jobs it is customary practice to station one man on guard on the outside while the other works within the dangerous atmosphere.

If all supervisors would bear in mind that an old employe on a new job or a different kind of machine is a "green" man so far as his new job is concerned, there would be fewer accidents in industrial plants, Emil C. Schultes, safety director, C. Hager & Sons Hinge Mfg. Co., St. Louis, Mo., stated at a session of the power press section. In rehiring an old employe or in transferring a man to a new job, too much often is taken for granted.

The speaker pointed out that a green man is never expected to handle process work without being first broken in. Yet executives often overlook the fact that the old employe must be given equally complete instructions after returning to work following a layoff. As an illustration of the effect of such an oversight, he stated that during the year of the rehiring period following the depression shutdown, the accident frequency in some 100 plants in St. Louis increased 85 per cent.

This is a graphic indication, he said, of the fact that the new man generally is not so great a risk as the old employe rehired. The new man generally is and should be made conscious of an organized safety program in the plant, in which everyone joins, from the highest executive down. He should be given a set of rules governing his work and complete instructions on how to handle his job. A similar program should be followed for veteran employes, regardless of how unnecessary this may seem, he declared.

Safety in tool design was discussed in a paper by George T. Koch, chief die designer, Murray Corp. of America, Detroit. It is possible to add some safety features after a tool has been completed, but it certainly is easier and less expensive to incorporate them during construction. In many cases, he said, it is impossible to change tools or dies satisfactorily after they have been completed. Mr. Koch's paper described in detail how dies should be designed, constructed and handled to afford maximum safety, also how presses should be guarded to provide adequate protection to the operator.

Build Safety Into Hammers

While almost any machine tool used for forging hot metal has lethal possibilities, the deadly aspects of a hammer are more spectacular and more likely to be final than those of other metal forming tools, declared C. C. Miller, engineer, Chambersburg Engineering Co., Chambersburg, Pa., in presenting a paper on building safety into hammers. A hammer, he said, is not amenable to the ordinary guard which may be used on other equipment. This condition is aggravated by the intimate relationship necessary between the hammer and the hammer operator.

Mr. Miller discussed in detail the construction of various types of hammers, pointing out how safety should be taken into consideration in design. The newer hammers are so designed to provide proper vision,

(*Please turn to Page* 61)

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MANUFACTURERS of machinery and engineers developing machines for special use will profit by specifying Lewis Gears to insure the proper and lasting operation of their products.

FOR many years Lewis Gears have fully met the very particular requirements of Industry. Built into Lewis Gears are—

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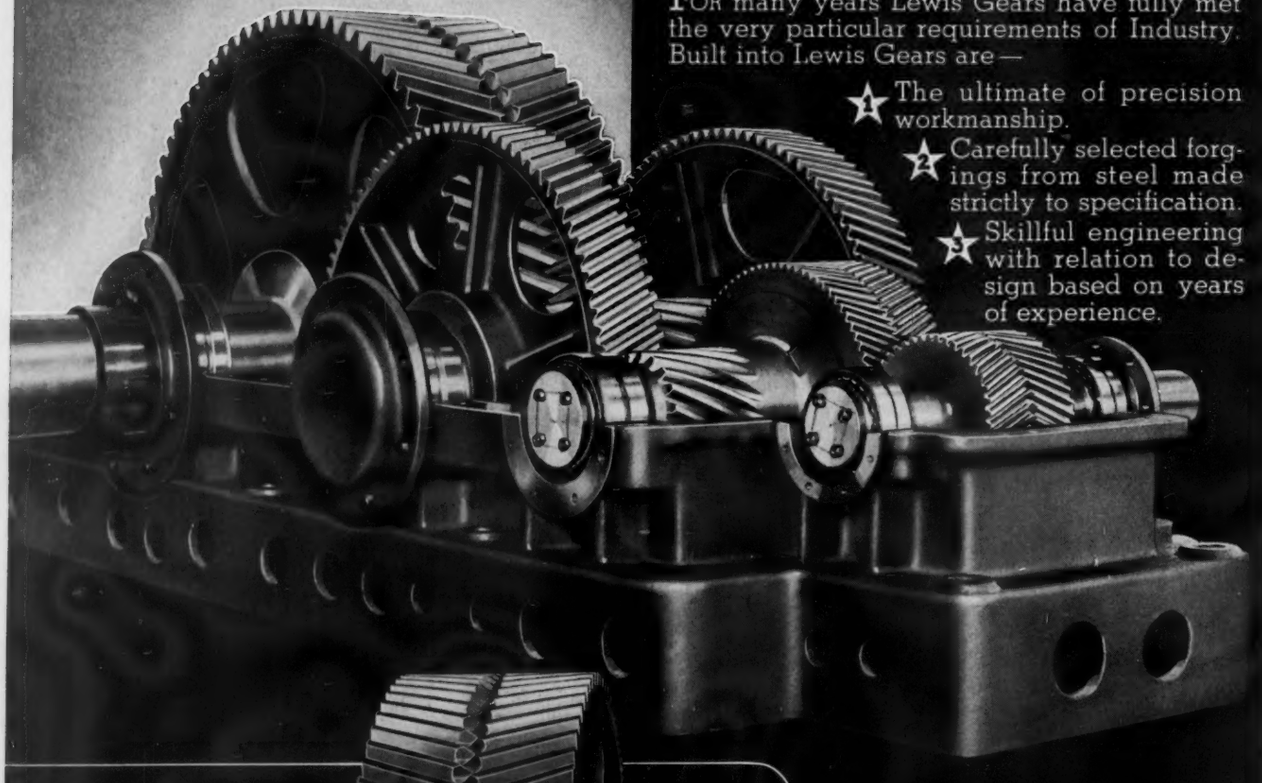

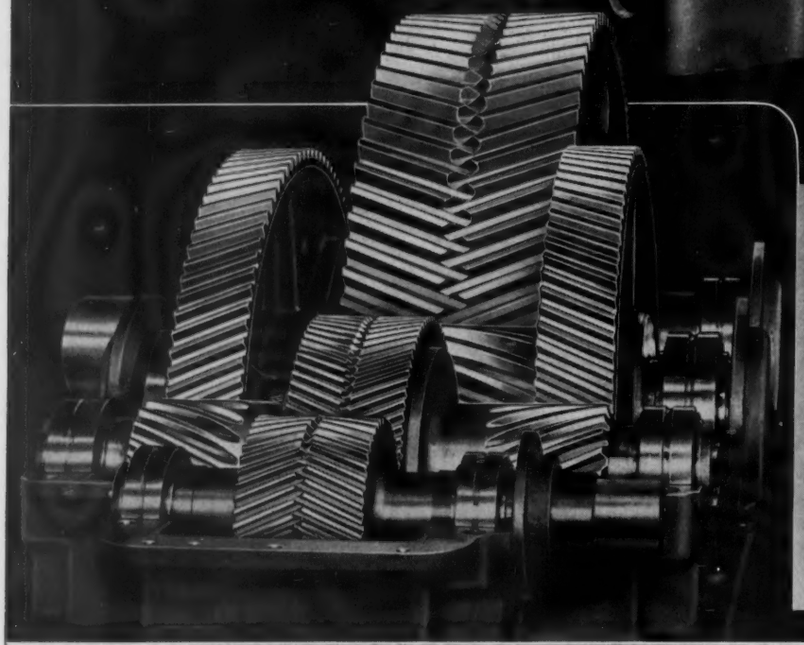

Lewis makes Single Helical Gears; Worm Gears; all types of Spur Gears; Herringbone Gears —and is equipped to handle all sizes including heavy gears for reduction drives of 5 H. P. up to 6000 H. P.

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Consumption of Gas in Steel Industry Is on Increase

UTILIZATION of gas in the metalworking industries and corrosion of gas pipe and appliances occupied important position among topics for discussion at the seventeenth annual convention of the American Gas association, held at the Palmer House, Chicago, Oct. 14-18. It was revealed that the use of gas in the iron and steel industry has increased tremendously in recent years. Reports on corrosion studies were presented at two of the sessions of the technical section.

The convention attracted several thousand delegates, though the lack of the customary general exposition restricted the attendance somewhat. The exhibition was confined to a display of accounting and office equipment.

L. B. Denning, president, Lone Star Gas Co., Dallas, Tex., was elected president of the association for 1935-36, succeeding P. S. Young, vice president, Public Service Electric & Gas Co., Newark, N. J. Two vice presidents were elected: Herman Russell, president, Rochester Gas & Electric Corp., Rochester, N. Y.; and N. C. McGowen, president, United Gas Public Service Co., Houston, Tex.

C. W. Gale, new business manager, Knoxville Gas Co., Knoxville, Tenn., was chosen chairman of the industrial gas section, with Ralph L. Manier, industrial heating engineer, Syracuse Lighting Co., Syracuse, N. Y., vice chairman. The new chairman of the technical section is F. A. Lydecker, general superintendent of gas distribution, Public Service Electric & Gas Co., Newark, N. J., while the vice chairman is Martin I. Mix, superintendent of distribution, Peoples Gas Light & Coke Co., Chicago.

Study Effects of Soil on Pipe

A report on soil corrosion mitigation in the gas industry, covering a study in various sections of the country, was presented by Dr. Scott Ewing, American Gas association research associate, national bureau of standards, Washington. During the past summer a four months' field trip was made to consult with gas engineers throughout the country and to remove and examine the third set of coated pipes in the American Gas association field coating tests. The object was to obtain a more intimate knowledge of pipe-coating practice in order to apply to the best advantage the information obtained from research in coatings and corrosion to various practical corrosion problems.

Observations indicated that a comparatively short-time test, properly carried out, is adequate, because much of the distortion of the softer coatings and the rotting of fabrics take place soon after burial. A serious attempt on the part of gas companies to take advantage of all that is known about coatings and corrosion was noted.

Results of a study made of the corrosion resistance of copper-base alloys when exposed to city gas at temperatures up to 275 degrees Fahr. were described in a paper by A. L. Ward and W. H. Fulweiler, United Gas Improvement Co., Philadelphia. This work was done in an endeavor to find an alloy that would be resistant to corrosion and more readily machined than aluminum for use in the construction of the regulating devices used on consumers' appliances.

It was found that alloys containing less than 63 per cent copper and in sheet or rod form are almost perfectly resistant to corrosion resulting from organic sulphur compounds in manufactured gas, and are improved still further by the addition of 0.5 per cent of either lead or aluminum. Tubes of similar alloys, however, are distinctly less resistant and it is recommended that aluminum tubing be used for installations where the tubing does not come in contact with alkaline insulation material and either tin plated tubing or a bimetallic tubing with aluminum on the inside and copper or brass on the outside where the tubing does come into contact with such material.

The report of the ferrous metals committee, headed by Hale A. Clark, Detroit City Gas Co., Detroit, indicated a tremendous growth in gas consumption in the iron and steel industry. In the Detroit district the volume of gas used has tripled the past ten years, reflecting increased consumption in heat treatment of automotive parts. Figures were reported for gas consumption in various steel treating operations. Typical data included: 1.85 cubic feet of gas per pound in hardening axle shafts; 2 cubic feet per pound in hardening leaf springs or coil springs; 2.4 cubic feet per pound in normalizing autobody sheets; 3.6 cubic feet per pound in carburizing ring gears and pinions; 3.6 to 6.4 cubic feet per pound in cyaniding auto parts.

Report on Refractories

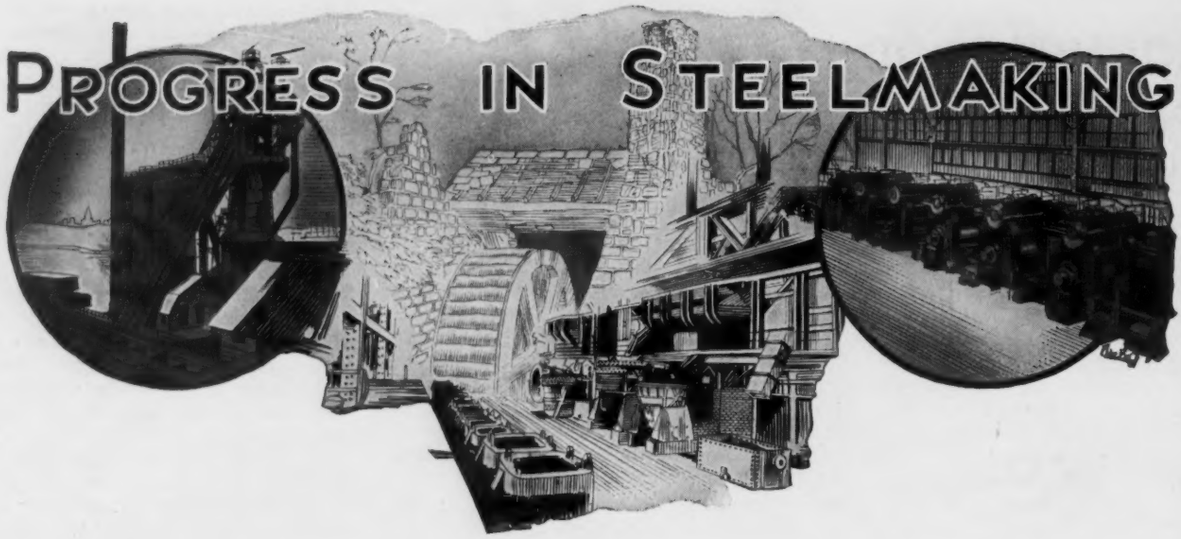
In discussing refractories for use with heat treating furnaces, it was recommended that insulating refractories be employed for such furnace units which frequently are brought to temperature from room levels. On high speed tool furnaces, the time of reaching a temperature of 2400 degrees Fahr. has been reduced from 3 hours to 2 hours. On cyanide furnaces, however, it has been observed that insulating refractories are not desirable because the brick too readily absorbs the cyanide which inevitably works over into the combustion chamber.

On a furnace 9 feet long, with two parallel chambers 2.5 x 2 feet, operating at a temperature of 2300 degrees Fahr. for the heating of nickel alloy billets for drawing into wire, the gas consumption for heating was reduced from 12,000 cubic feet to 9000 cubic feet in the 2½ hours taken to reach temperature. Operating consumption after reaching temperature was reduced from 3100 to 2600 cubic feet per hour. It must be observed, however, that if this furnace were operating on a 24-hour schedule, economy of approximately 13 per cent which now appears from a 10-hour schedule would not be present.

Significant developments have occurred recently in various phases of heat treatment of iron and steel, the report pointed out. "In hardening, the use of muffle type furnaces and radiant tube type furnaces, with specially prepared atmospheres about the work; in drawing, the circulation of the products of combustion from gases burned in an external chamber; and in malleablizing, the possibility of the use of radiant tube furnaces—all are matters of the liveliest interest which are yet relatively new but of great promise."

Would You Like a Copy of Hardness Conversion Chart?

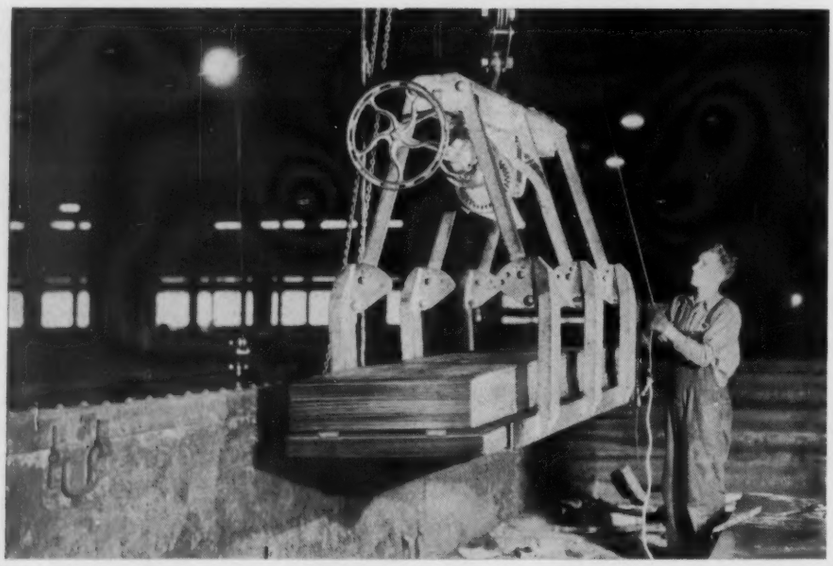
BECAUSE of a considerable demand for copies of the handy hardness conversion chart presented as a supplement to its issue of Sept. 23, STEEL *has prepared a limited number of reprints. These are available at 25 cents for the first copy and 10 cents for all additional copies. This copyrighted chart, reproduced on heavy stock, 8½ x 11½ inches, is suitable for framing or placing under a desk glass, and shows at a glance the conversions between the four most commonly used indexes: Brinell, Scleroscope, Rockwell B and Rockwell C. Copies will be mailed flat promptly upon receipt of order while the supply lasts.*



Prevents Surface Rusting

Research covering a period of five years has resulted in the development of a rust preventative suitable for all kinds of metal parts. The thin brown fluid not only has corrosive-resisting properties but is said to serve as a good lubricant and thus can be left upon the surface of moving parts when assembled. Small articles are coated by submersion in a bath and then removed for drying. The preventative is applied to larger articles by means of a brush, cloth or spray; steel sheets are coated by the use of felt rollers. Three to four hours are required for the coating to set in which time it develops into a lasting film unaffected by heat, moisture or chemical fumes. While the coating will remain in this condition indefinitely it is removed easily by wiping with a cloth that has been soaked in kerosene. The liquid may be used for protecting machine tools, bolts and nuts, drills, reamers, auto and engine parts, small springs, razor blades, textile machinery, heavy gears and sheet steel.

Lifter Minimizes Handling Spoilage of Sheets



LESS STORAGE SPACE REQUIRED — Use of a newly developed sheet lifter makes it possible to build up storage piles with only about 6 inches of space between piles of sheets. The carrying arms of the lifter are hinged. They can be moved in or out and pinned in various positions so that they will hang almost vertical. This is to facilitate lowering the arms in small spaces between piles. High-grade sheets are handled without scratching the surface or damaging the edges. Adjustment of the jaws for handling different widths of sheets is made in a few seconds. A further help to speedy handling is the positive jaw control, operated by one man through the wheel at the end of the lifter. The location of the wheel at the end of the lifter permits the operator to work from the floor at all times. It is never necessary for him to climb in between piles of sheets or to get on top of a pile to close or open the lifters. The device is made by Cullen-Friestedt Co., 1300 South Kilbourn avenue, Chicago

Heat Losses Are Curtailed

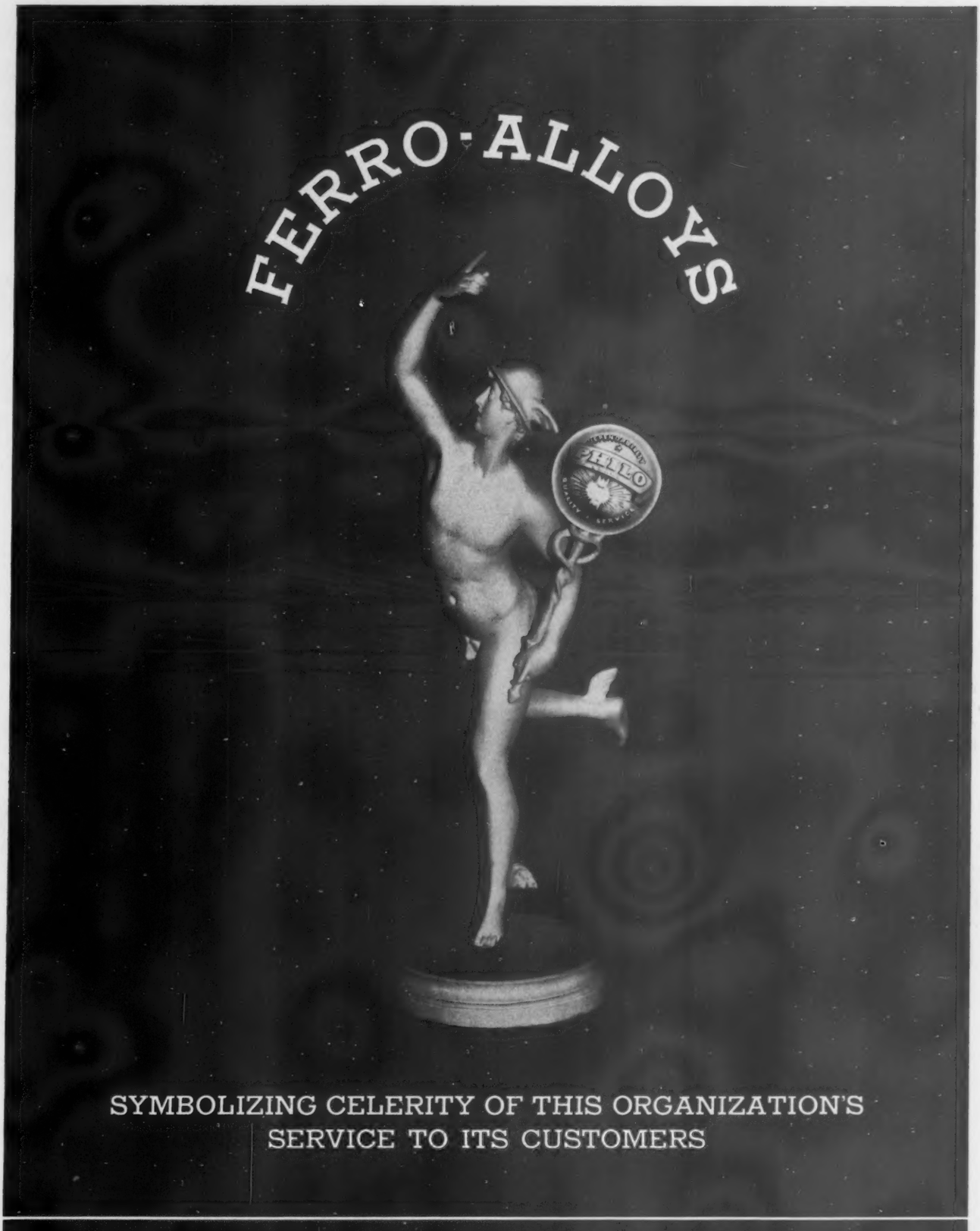
Approximately 3000 B.t.u. an hour per furnace is being saved at an Ohio open-hearth shop by eliminating most of the water-cooling devices on the 25-ton furnaces. Neither the doors, which are made of heat-resisting metal, nor the valves are water-cooled.

Pipe Line Handles Slag

Transportation of molten slag in cinder pots from the blast furnaces to the lake front at a Canadian plant is to be discontinued. Instead, the slag will be granulated and conveyed by hot water through a pipe line which will terminate at the company's property on the waterfront. Here it will be scattered hydraulically to make land for future plant extension.

Markets Sealing Compound

Leakage of gas, vapor, oil, steam and water is prevented as well as rust and corrosion of threads by a newly marketed sealing compound. The new product is claimed to be indestructible, nonhardening, nonsolvent, tight-gripping, vibration-proof, nonshrinking, noncracking and noncrumbling.


FERRO-ALLOYS
SYMBOLIZING CELERITY OF THIS ORGANIZATION'S
SERVICE TO ITS CUSTOMERS
Ohio Ferro-Alloys Corporation
Canton, Ohio

Chapter IX — Part III

Factors for Calculating Thermal Effects in Regenerators

SIX fuels which are typical of American practice have been selected. Their analyses and combustion data are presented in Table CXXXIII.

All of the foregoing has been directed towards the determination of the proportional volumes of the several gases involved in order that the sensible heat contained in them may be found and thus permit the development of the thermal capacity charts which are the base of the simplified method. The sensible heat values of the gases at elevated temperatures are offered in Table CXXXIV. These values are developed from the analytical work on the specific heat of gases by Goodenough and Felbeck*.

Thermal capacity charts have been constructed for the six typical fuels and are presented in Figs. 169 to 174

*Bulletin No. 139, Engineering Experiment station, University of Illinois, Urbana, Ill., "An Investigation of the Maximum Temperatures and Pressures Attainable in the Combustion of Gaseous Fuels," by G. A. Goodenough and G. T. Felbeck.

Results Are Charted

The curves are constructed using the data of Tables CXXXIII and CXXXIV and the description of the method employed as applying to those of producer gas operation, Fig. 169, is given. To develop the curve "Heat in Products of Combustion" each of the three items of the synthesis of the products of combustion, Table CXXXIII, are multiplied by the complementary sensible heat values of Table CXXXIV at several temperature points, such as 500, 1500, 2500, and 3500 degrees Fahr. The sum of the sensible heats of the three components at the same temperature thus represent the total heat in the products of combustion at that temperature, and the several points of the curve are plotted using temperature values as ordinates and the B.t.u. per 1 cubic foot of fuel burned as abscissae, and the curve thus is drawn accordingly.

The curve "Heat in Air for Combustion" is found by multiplying the total air required by the sensible heat values for air at appropriate temperatures, and this curve and that of the gas following need not be extended but slightly above the range of its preheat.

The curve "Heat in Producer Gas" then is developed similarly by finding the sum of the sensible heat in each of the components of its analysis at appropriate temperature intervals.

The charts for the other fuels are developed in a similar manner noting, however, that the steam used in atomizing the liquid fuels is carried

Table CXXXIV

Sensible Heat, B.t.u., Above 32 Degrees Fahr. in 1 Cu. Ft. of Common Gases of Combustion Practice

Temp. of gas, deg. Fahr.	O_2-N_2 Air,-CO	Carbon dioxide, CO_2	Water vapor, H_2O	Hydrogen, H_2	Methane, CH_4	Ethane, C_2H_6	Ethylene, C_2H_4
500	9.34	12.61	11.04	9.60	21.48	23.09	19.61
1000	19.27	27.94	22.96	19.81	44.42	47.74	40.57
1500	29.20	44.67	35.65	30.02	67.37	72.42	61.52
2000	39.14	62.69	49.35	40.24	90.31	97.08	82.48
2500	49.07	81.19	63.38	50.48	113.26	121.75	103.43
3000	59.00	99.95	80.75	.....	.....	.....	.....
3500	68.93	119.25	99.08	.....	.....	.....	.....
4000	78.87	138.60	119.56	.....	.....	.....	.....

Note:—Values presented for hydrocarbons at higher temperatures are approximate.

Table CXXXIII

Analyses and Combustion Data of Six Typical Open-Hearth Fuels

Analysis by	Symbol	Producer gas	Mixed C.O. and B.F. gas	Coke oven gas	Natural gas	Fuel oil	By-Prod. tar
		Volume, %				Weight, %	
Carbon	C	.....	.....	.....	.....	85.3	83.0
Carbon dioxide	CO_2	4.0	9.6	1.2	.....	.....	.....
Ethylene (Ill.)	C_2H_4	0.3	0.6	1.6	.....	.....	.....
Carbon monoxide	CO	23.8	21.2	6.8	.....	.....	.....
Methane	CH_4	3.0	13.3	30.0	80.4	.....	.....
Ethane	C_2H_6	.....	.....	.....	18.7	.....	.....
Hydrogen	H_2	11.0	14.5	50.0	.....	14.1	10.0
Nitrogen	N_2	57.9	40.8	10.4	0.9	0.2	4.0
Oxygen	O_2	.....	.....	.....	.....	0.4	1.0
Water	H_2O	.....	.....	.....	.....	.....	2.0
Total		100.0	100.0	100.0	100.0	100.0	100.0
Pounds 1 gallon						7.64	9.60
B.t.u. per unit*		138	237	455	1034	19,627	17,188
Air per unit for Combustion, ft.³		1.164	2.216	4.459	10.826	182.456	171.478
Steam for		.....	.....	.....	.....	9.924	9.924
Atomization†, ft.³							
Products of combustion		(Ft.³/Ft.³ For Gas Fuels—Ft.³/lb. for Liquid Fuels)					
Carbon dioxide	CO_2	0.274	0.453	0.400	1.178	25.471	24.789
Water vapor	H_2O	0.216	0.423	0.932	2.169	35.207	28.254
Nitrogen	N_2	1.592	2.159	3.620	8.572	144.329	127.854
Total		2.082	3.035	4.952	11.919	205.007	180.897

*Ft.³ gases; lbs., liquids.
†0.5 lb. steam @ 19.924 ft.³/lb. per pound liquid fuel.

into the products of combustion as an addition to the water vapor.

Such charts as here presented are of almost endless value in either the analysis of furnace operation or the synthesis of design.

The theoretical flame temperature (TFT) of the several fuels is indicated as a function of the calorific value of the fuel. This value is for cold air-cold fuel operation. Theoretical flame temperature may be developed only when there is no radiation from the flame, an impossible condition in practice but offers a relative method of comparing various fuels as temperature develops. With cold air-cold fuel practice only about two-thirds of the TFT of producer gas and three-quarters of the TFT of the other fuels are possible of development in commercial operation. Therefore, through lack of temperature it virtually is impossible to make steel with any of the fuels unless other sources of heat are developed.

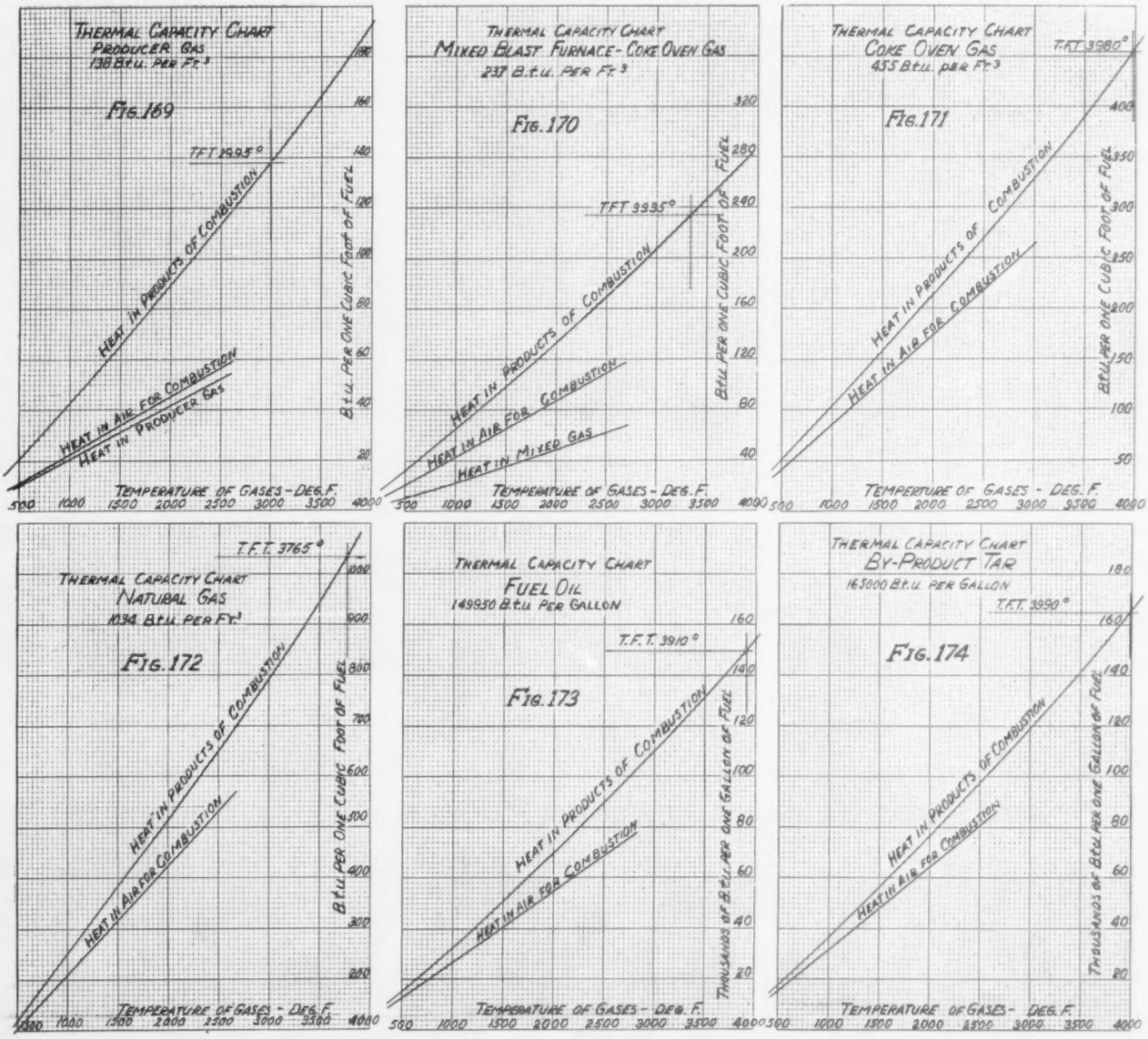
Several years ago an attempt was made to melt high-carbon steel with oil fuel and cold air practice. Satisfactory steel was produced but the fuel consumption was nearly 200 gallons per ton.

How Heat Is Obtained

Heat is added to the open-hearth operation by preheating the air in all methods and superheating the fuel in producer gas and under certain conditions in mixed gas practice.

The effect of preheat on the operation is evidenced clearly from the charts. In producer gas practice assume the air to be preheated to 2000 degrees Fahr. From Fig. 169 the heat in the air may be found as 45 B.t.u. carried into the combustion reaction for each cubic foot of producer gas burned. If this heat is added to the sensible heat in the products of combustion at TFT, 138 B.t.u. the total sensible heat in the products becomes the sum of the values or 183 B.t.u. A new TFT under such conditions now may be found as about 3850 degrees Fahr. Again if the temperature of the fuel entering the furnace is assumed at 2200 degrees Fahr. and 46 B.t.u. a new total value of 229 B.t.u. is found as the total heat in the products of combustion which, by extrapolation, develops a final TFT of nearly 4700 degrees Fahr. Thus, the value of preheat in its elevation of the temperature of the flame may be shown definitely.

In a somewhat similar manner the deleterious effect of excess air to the operation may be demonstrated. Thus, if the Orsat analysis has shown 20 per cent excess air and the air temperature is found as 1800 degrees Fahr. the total heat in the air is

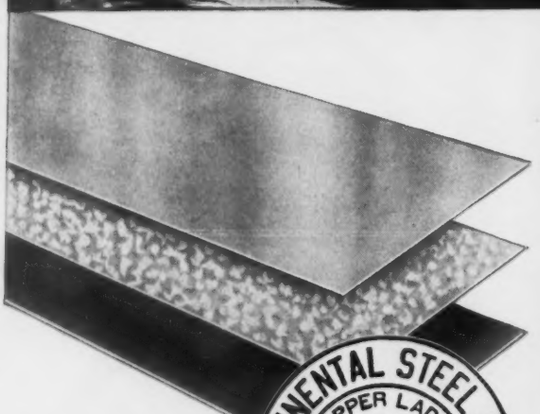

THERMAL CAPACITY CHART
PRODUCER GAS
138 B.t.u. PER Ft.³
FIG. 169
TFT 2995°
HEAT IN PRODUCTS OF COMBUSTION
HEAT IN AIR FOR COMBUSTION
HEAT IN PRODUCER GAS
B.t.u. PER ONE CUBIC FOOT OF FUEL
TEMPERATURE OF GASES - DEG. F.
THERMAL CAPACITY CHART
MIXED BLAST FURNACE - COKE OVEN GAS
237 B.t.u. PER Ft.³
FIG. 170
TFT 3995°
HEAT IN PRODUCTS OF COMBUSTION
HEAT IN AIR FOR COMBUSTION
HEAT IN MIXED GAS
B.t.u. PER ONE CUBIC FOOT OF FUEL
TEMPERATURE OF GASES - DEG. F.
THERMAL CAPACITY CHART
COKE OVEN GAS
435 B.t.u. PER Ft.³
FIG. 171
T.F.T. 3980°
HEAT IN PRODUCTS OF COMBUSTION
HEAT IN AIR FOR COMBUSTION
B.t.u. PER ONE CUBIC FOOT OF FUEL
TEMPERATURE OF GASES - DEG. F.
T.F.T. 3765°
THERMAL CAPACITY CHART
NATURAL GAS
1034 B.t.u. PER Ft.³
FIG. 172
HEAT IN PRODUCTS OF COMBUSTION
HEAT IN AIR FOR COMBUSTION
B.t.u. PER ONE CUBIC FOOT OF FUEL
TEMPERATURE OF GASES - DEG. F.
THERMAL CAPACITY CHART
FUEL OIL
149930 B.t.u. PER GALLON
FIG. 173
T.F.T. 3910°
HEAT IN PRODUCTS OF COMBUSTION
HEAT IN AIR FOR COMBUSTION
THOUSANDS OF B.t.u. PER ONE GALLON OF FUEL
TEMPERATURE OF GASES - DEG. F.
THERMAL CAPACITY CHART
BY-PRODUCT TAR
163000 B.t.u. PER GALLON
T.F.T. 3950°
FIG. 174
HEAT IN PRODUCTS OF COMBUSTION
HEAT IN AIR FOR COMBUSTION
THOUSANDS OF B.t.u. PER ONE GALLON OF FUEL
TEMPERATURE OF GASES - DEG. F.

Figs. 169 to 174—Charts showing thermal capacity of various types of gases, fuel oil and by-product tar

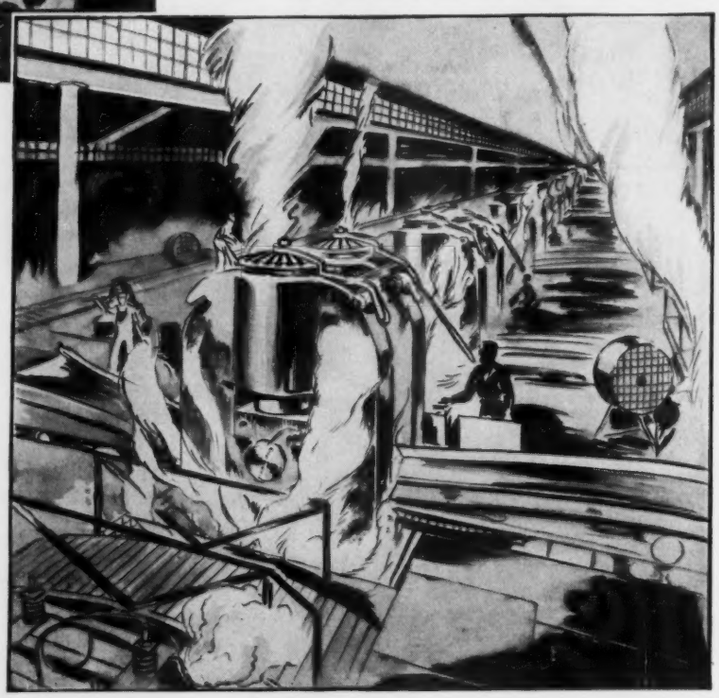
SPECIALIZING IN COATED SHEETS

The more exacting the service demands on your product or the more difficult its forming or fabrication, the more valuable you will find the properties of Continental coated sheets. Regular galvanized, "Seal of Quality" extra heavy (2-oz.) galvanized, and Galvannealed—the fused zinc coating that bonds the paint, lacquer and enamel—all are supplied on base metal of varying analysis and heat treatment to meet most perfectly your manufacturing and service conditions; to add value to your product while cutting your production costs.

CONTINENTAL STEEL CORPORATION
General Offices: Kokomo, Indiana
Plants at Canton, Kokomo and Indianapolis



Copperior Sheets—with any of the coatings above mentioned or uncoated—are rolled from open-hearth steel of special analysis including 20 points minimum of copper. Apart from its coating COPPERIOR under atmospheric corrosion outlasts ordinary sheet steel two to three times. Supplied in standard sizes and gauges, and tempers to suit the job.



OPEN HEARTH STEEL • Commercial and Copper-Bearing

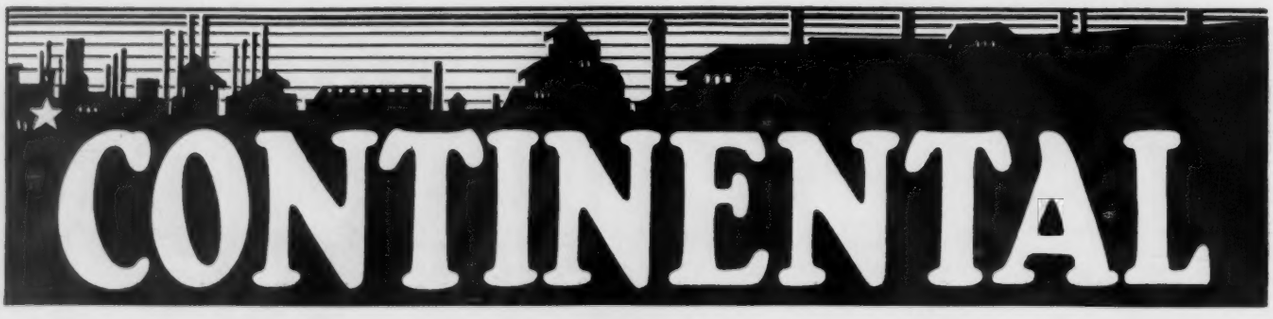
Billets
Wire Rods
Bright Basic, Annealed, Konik and Galvanized Wire

Nails
Staples
Barbed Wire
Bale Ties
Gates and Posts

Farm, Poultry, Lawn, Diamond Mesh Chain-Link Fence
Hot Rolled Annealed Sheets

Hot Rolled Sheets
Cold Rolled Sheets
Special Blue Sheets
Uniform Blue Sheets
Single Pickled Sheets

Deoxidized Sheets
Galvanized Sheets
Galvanized Roofing
"Seal of Quality" Roofing
Formed Products



40 × 1.20, or 48 B.t.u. If the correct air volume was used and the 48 B.t.u. transferred to it, the air temperature would be about 2150 instead of 1800 degrees Fahr. The reduction of the TFT as a result of this excess air would be in the *approximate* inverse ratio of the volume of the air to that of the furnace gases multiplied by the temperature difference, 350 degrees Fahr. resulting from the excess air.

As to the value and the use of the charts in the analytical consideration of operation, the following will serve to illustrate the principle:

Heat Balance Is Determined

Assume that in a ten-minute reversal cycle 114,000 cubic feet of producer gas is burned with 10 per cent excess air. That 60 per cent of the products of combustion enter the air regenerator chamber at $A_{11}A$ at a mean temperature of 2850 and leave at 1350 degrees Fahr. at $A_{12}A$. That the air enters at $A_{12}A$ at 500 and leaves at $A_{12}A$ at 1950 degrees Fahr. The heat balance of the regenerator for the cycle is developed by the procedure presented in the accompanying example.

From the example it will be evident that given only the quantity of fuel used, the percentage of the theoretical air in the combustion products and the appropriate temperatures a quantitative analysis of heat distribution in a furnace system to cover the whole or a single component is accomplished easily with a few simple instruments and thermal capacity graphs, and in detail that may be as brief as that indicated in the example or amplified to the extent desired. Such analyses or studies are necessary to the general betterment of the furnace and process and if generally carried out in a similar manner so that all data are truly comparative progress in the art will accrue more rapidly.

One point developed by the example which is worthy of particular consideration is the efficiency of the regenerator. This usually is stated as heat transferred in regenerator to air × 100 ÷ heat left in regenerator by furnace gas = per cent efficiency of the regenerator, or as in the example, 4,138,000 × 100 ÷ 8,960,000 = 46.2 per cent.

The second law of thermodynamics applies here and accordingly the foregoing equation is incorrect.

Involved Higher Temperature

The heat in all of the products from the combustion of one unit of producer gas, Fig. 169 at 2850 degrees Fahr. is 131 B.t.u. and in the 60 per cent presumed to enter the air regenerator 131 × 0.60 or 78.6 B.t.u. In accordance with the foregoing equation, for the regenerator to be 100 per cent efficient would necessitate that 78.6 B.t.u. be transferred to the air in which case the air temperature would be 3450 degrees ÷ 1.10 or about 3140 degrees, nearly 300 degrees Fahr. higher than the influent furnace gas.

If 110 per cent of air were heated to 2850 degrees Fahr., the highest temperature possible, it then would contain but 70.4 B. t. u. which, however, would represent 100 per cent regenerator thermal effect. Under the condition established, therefore, the true thermal efficiency of the regenerator would be 4,138,000 × 100 × 78.6 ÷ 8,960,000 × 70.4 = 51.6 per cent.

While the example shown is that of producer gas operation, the same condition exists in a varying degree in the use of any of the fuels.

The determination of all of the factors entering into the method of analysis have been explained excepting a simple method of finding the percentage of air entering the combustion reaction. Given the percentage of CO_2, O_2 and CO in the furnaces the percentage of the air flowing either over or under the volume necessary for theoretical combustion may be read from the alignment diagram, Fig. 175, after having given effect to the following comments.

When but CO_2 and O_2 are shown as components of the Orsat analysis the diagram is used as indicated by the dotted line, 8 per cent, CO_2, 8 per cent O_2 = 57.8 per cent excess air or 157.8 per cent of the theoretical air required.

Chart Is a Time-Saver

When CO_2, O_2 and CO are indicated by the analysis locate the CO_2 value on the carbon dioxide line, and cross the oxygen line with the difference between the O_2 and one-half the CO content of the analysis. If the O_2 is greater than CO ÷ 2 then the reading will indicate per cent excess air, or if the CO ÷ 2 be greater than the O_2 the reading will indicate per cent deficiency of air.

Should only CO_2 and CO be shown by the analysis proceed as before but cross the oxygen scale with one-half of the CO and the result indicated will be per cent deficiency of air.

The equation used as the basis of the alignment diagram is:

$$\text{Per cent excess (or deficiency) of air} = \frac{7900\,A}{2100 - 21\,CO_2 - 100A} \quad \ldots\ldots(53)$$

In this equation, A = per cent O_2 when no CO is present, the result being per cent excess air or if O_2 and CO are both present $A = O_2 - \frac{CO}{2}$ = per cent excess air if $O_2 > \frac{CO}{2}$, or if $\frac{CO}{2} > O_2$, then $A = \frac{CO}{2} - O_2$ = per cent deficiency of air. When

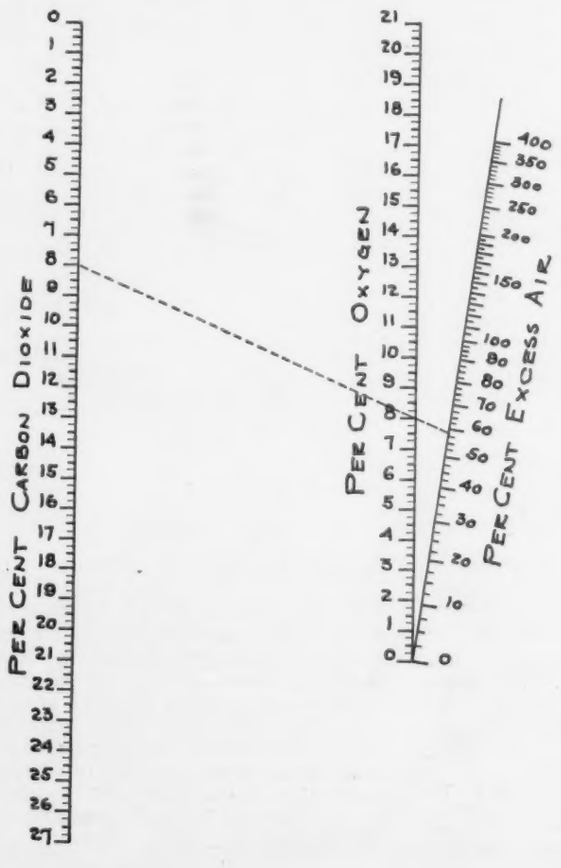


Fig. 175—Chart for the solution of readings of Orsat apparatus

CO is present and there is no O_2, showing, $A = \frac{CO}{2}$ = per cent deficiency of air.

ITEM 3. The exposed surface areas of the checkerwork as found in the typical and proposed furnaces and which are important factors in heat exchange effects have been previously solved and listed in Table CXXV. The wall surfaces of the proposed furnaces, which also act as heat exchange media, are listed in Table CXXVI. These values enter the calculations of the succeeding chapter.

ITEM 4. The calculated average velocity of the several fluids of operation, developed in passing through the checkerwork of the typical and proposed furnaces under specific conditions of operation are listed in Table CXXIV.

All of the methods and much of the data of the present chapter enter into the determination of specific heat exchange effects which are the subject of the subsequent chapter.

(To be continued)

International Acetylene Association Announces Program for Convention

AN ATTRACTIVE and expansive program has been arranged by the International Acetylene association for its thirty-sixth annual convention to be held in Cleveland, Nov. 12-15. The tentative outline, just announced, embraces six technical sessions at which some 20 papers will be read and discussed. Headquarters will be maintained at Hotel Cleveland, and the majority of the sessions will be held there.

Among the theme topics for technical sessions are safety, metallurgy of welding and cutting, piping and pressure vessels, and transportation. The opening session will be general in character and will include the address of welcome, a keynote address and the president's address. Award of the Morehead medal will be made at this meeting. A session on the evening of Nov. 13 will take the form of a forum on welding and cutting and will include a wide array of subjects and demonstrations.

Industrial Drama Scheduled

Featuring this year's convention program as it has in recent years, will be a four-act industrial drama to be staged in the Music Hall of Public Auditorium, on Tuesday evening, Nov. 12. "Profits of Progress" is the name of the production, written by Wilfred P. Burglund. The cast will include 17 characters. Unique in the history of technical society meetings, this play is said to offer sound and valuable information on the oxyacetylene process.

The association's annual meeting will be held at a luncheon meeting on Nov. 14 at which time officers and committees will present reports and new officers will be elected.

The detailed program for the convention is as follows:

Tuesday, Nov. 12

MORNING

Address of welcome, by Dr. W. E. Wickenden, president, Case School of Applied Science, Cleveland.

Keynote address, by Merle Thorpe, editor, *Nation's Business*, Washington.

President's address, by Philip Kearny, K-G Welding & Cutting Co., New York.

Twelfth International Acetylene congress, London, 1936, by A. Bede Harrower, British Oxygen Co. Ltd., London.

"Acetylene in the Chemical Industry," by A. F. G. Cadenhead, chief of plant research department, Shawinigan Chemicals Industry Ltd., Shawinigan Falls, Quebec.

Presentation of Morehead Medal.

AFTERNOON

Safety

Reports of legislative and insurance committee and technical and engineering committee, by H. S. Smith, Prest-O-Lite Co. Inc., New York, and chairman, executive committee, International Acetylene association.

"Prevention of Welding and Cutting Fires," by C. D. Abbott, district manager, Associated Factory Mutual Fire Insurance Co.'s, Cleveland.

"Safe Handling, Storage and Return of Compressed Gas Containers," by F. R. Fetherston, secretary, Compressed Gas Manufacturers' association, New York.

"Studies in Industrial Health of Interest to the Oxyacetylene Industry," by W. P. Yant, superintendent, experiment station, United States bureau of mines, Pittsburgh.

EVENING

"Profits of Progress," a four-act industrial drama by Wilfred P. Burglund. Music Hall, Public Auditorium, 8:15 p.m.

Wednesday, Nov. 13

AFTERNOON

Metallurgy of Welding and Cutting

"Welding and Cutting of High Chromium Steels," by W. J. Priestley, vice president, Electro Metallurgical Co., New York.

"Further Studies of Oxyacetylene Cut Steel Plate," by Prof. J. H. Zimmerman, Massachusetts Institute of Technology, Cambridge, Mass.

"Hydrocarbon Fuel Gases for Cutting," by Dr. George Slottman, Air Reduction Sales Co., New York.

"Gas Welding Aluminum and Its Alloys," by G. O. Hoglund, supervisor of welding, Aluminum Co. of America, New Kensington, Pa.

EVENING

Welding and Cutting Forum

Part I

Materials used in the oxyacetylene process.

Oxyacetylene cutting — theory and practice.

"Identifying Metals to Be Welded," by Dr. A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories Inc., New York, and chairman, Iron and Steel division, American Institute of Mining and Metallurgical Engineers.

Demonstrations and explanation of certain recent welding techniques.

Part II

"Safe Practices in Using the Oxyacetylene Process," by James Banash, consulting engineer, International Acetylene association, and past president, National Safety council.

Part III

"Testing Welds and Welded Structure," by John J. Crowe, engineer in charge, apparatus research and development department, Air Reduction Sales Co., New York, and president, American Welding society.

Thursday, Nov. 14

NOON

Annual Luncheon and Business Meeting

Reports of officers and committees.

Election of officers.

AFTERNOON

Piping and Pressure Vessels

"High Pressure Piping," by J. A. Freiday, mechanical engineer, Thomas J. Murray Inc., New York.

"Welding Class I Pressure Vessels," by G. W. Plinke, director of research, Henry Vogt Machine Co., Louisville, Ky.

"Welded Piping and Pressure Vessels in the Marine Field," by J. W. Wilson, engineer, bureau of navigation and steamboat inspection, department of commerce, Washington.

"Permanency of Oxyacetylene Welding," by F. C. Hutchison, engineer, Linde Air Products Co., Kansas City, Mo.

Friday, Nov. 15

AFTERNOON

Transportation

"Maintenance-of-Way Problems in High Speed Transportation," by Armstrong Chinn, chief engineer, Chicago & Alton railroad, Chicago.

"Oxyacetylene Process in Maintenance-of-Way Work," by L. J. Turner, chief rail inspector, Chicago, Rock Island & Pacific Railway Co., Chicago.

"Shape Cutting of Locomotive and Car Parts," by James Grant, superintendent of motive power, Atlantic Coast Lines, Waycross, Ga.

"Economic Advantages of the Oxyacetylene Process to Railroads," by George Durhan, vice president, Wheeling & Lake Erie railroad, Cleveland.

Buys Oxygen in Group

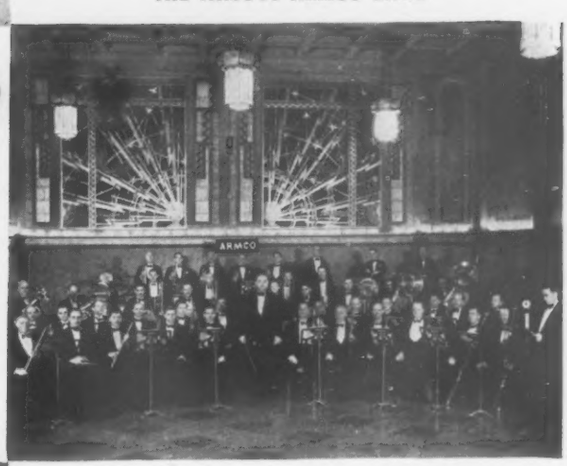
Boston chapter of the Institute of Scrap Iron and Steel Inc., which recently adopted a group plan for compensation insurance, has now adopted a plan for co-operative purchase of oxygen. The initial rate is $1, compared with approximately $1.20 now being paid by the average dealer to various companies. Harry Cohen, of H. Cohen & Co., Chelsea, Mass., is president of the chapter.

FRANK SIMON, CONDUCTOR

THE ARMCO IRONMASTER

Strike up the Band

THE FAMOUS ARMCO BAND



WJZ New York	WSYR Syracuse	WENR Chicago
WBZ Boston	WHAM Rochester	KWK St. Louis
WBZA Springfield, Mass.	KDKA Pittsburgh	WMT Cedar Rapids Waterloo
WFIL Philadelphia	WGAR Cleveland	KSO Des Moines
WBAL Baltimore	WXYZ Detroit	KOIL Omaha Council Bluffs
WMAL Washington, D. C.	WLW Cincinnati	WREN Kansas City

At 10:30 Eastern Time on the evening of October 28, Conductor Frank Simon will lift his baton . . . Another series of Armco Ironmaster Broadcasts will be underway over the NBC Blue Network.

Monday nights thereafter will see thousands of family parties enjoying the fine music of radio's most popular band. And that old favorite, the Armco Ironmaster, will be at the "mike" again with his fascinating stories of current industrial developments.

FABRICATORS who use Armco flat-rolled iron and steel grades benefit appreciably by the product-acceptance these broadcasts generate. This seventh year of radio broadcasting coupled with fifteen years of advertising in popular national magazines has created a vast reservoir of good will for products made of Armco metals. It is almost a buying religion for people to ask, "Is it made of Armco INGOT IRON?" . . . or Armco Stainless, or some other well-known Armco metal. • Listen in to this first Monday-night Armco broadcast on October 28, and judge for yourself what it means to use Armco Iron and Steel — *beyond the good fabricating qualities of the metals themselves.* The American Rolling Mill Company, Executive Offices, 703 Curtis St., Middletown, Ohio.

ARMCO

The name in iron and steel that millions know

Steel a Suitable Material for Dams

(*Concluded from Page* 18)

tally neglected for more than 30 years. This type of steelwork is desirable tonnage for the shops and its installation can be developed into a simple and good class of erection which only requires equipment now common in most organizations. The two existing dams have been proved to be safe, satisfactory, durable and economical.

The rather intensive study of this type of dam has been made with the thought that its adoption is economically justified for many locations and that the fabricators have overlooked a desirable source of tonnage which should produce additional work throughout a competent organization. It is hoped that the possibilities of what should be a fruitful field of endeavor will be thoroughly developed, said Dr. Hovey in closing.

In discussing Dr. Hovey's paper, F. T. Llewellyn, United States Steel Corp., New York, declared that the excellent work done by the author would not have been possible if it had not been for the co-operation of certain steel fabricators in supplying and sharing information. He urged all fabricators to be more liberal in exchanging data on the application of steel to new uses.

Problems in connection with the fireproofing of construction steel were discussed by S. H. Ingberg, chief, fire resistance section, national bureau of standards, Washington. Mr. Ingberg pointed out that the main object of structural protection is to prevent the occurrence of temperatures in the metal that induce failure under supported loads. For recognized design working stresses, this means that average temperatures over the stressed sections of structural steel members must be maintained below about 1000 degrees Fahr.

The speaker recounted that in recent years thickness requirements in building codes, as backed by the results of tests, have been superseded in part by performance requirements in terms of fire resistance developed in prescribed tests. Mr. Ingberg declared that while this places materials on a fairer basis with respect to each other, care must be taken in stating performance limits so that protections may be prescribed which are commensurate with the fire severities to be expected in given locations.

Illustrates Fire Hazards

Dr. Ingberg displayed numerous pictures of disastrous fires in this country to illustrate the types of fire hazards with which fire-resistant construction must contend.

A paper by Dr. J. H. Young, vice president, H. H. Robertson Co., Pittsburgh, scheduled for this convention, was deferred to a later date to permit the author to incorporate results of an important research on fireproof construction still in progress.

In an address entitled "How to Improve Steel Structures," H. L. Whittemore, chief, engineering mechanics section, national bureau of standards, Washington, presented a number of impressions gained from experience on metal structures at the national bureau of standards, some of which seem to show a backwardness on the part of the steel industry in the matter of collecting adequate engineering data pertaining to its products.

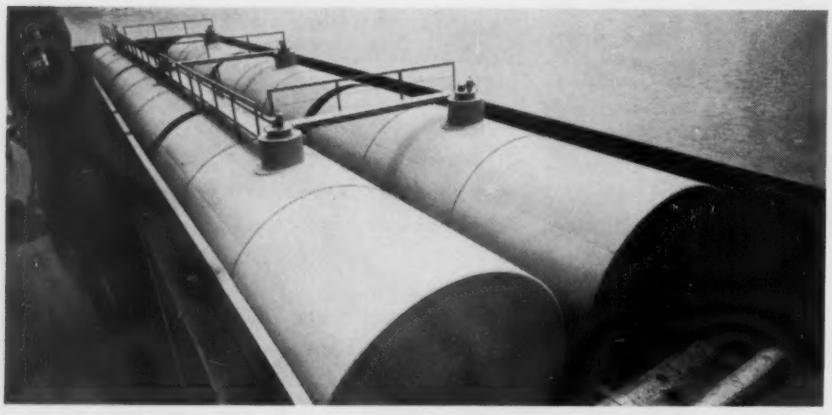
Dr. Whittemore also referred to the extent to which reinforced concrete is emphasized in the class rooms and material laboratories of many universities, particularly in the middle west.

In this connection he declared that the hand strain gage is responsible for much of the present knowledge of reinforced concrete. He pointed out that the strain gage is equally suitable for determining stresses in steel structures. It was used at the Hell Gate bridge and on the George Washington bridge. However, stated Dr. Whittemore, in the past when making investigations of steel structures in our laboratories in co-operation with large steel fabricating organizations we have usually found a lack of enthusiasm when it was proposed to take steel gage readings.

These organizations were interested only in knowing the ultimate strengths. Usually they considered specimens of steel for the determination of the properties of the material entirely unnecessary. "If this attitude is general in the steel industry," asked Dr. Whittemore, "is it any wonder that many structures are built of reinforced concrete for which steel would have been preferable?" Dr. Whittemore said, "It seems to me that in this country less attention is paid to research on metal structures than to any other branch of engineering."

The speaker also reported on the progress of rigid bridge frame tests in which fabricated bridge members subjected to compression in a 600,000-pound testing machine are studied for stresses by means of strain gage readings.

New Type River Barge



CYLINDRICAL TANKS IN THE OPEN HOPPER CARGO SPACE RATHER THAN THE CONVENTIONAL TANK COMPARTMENTS FOR HANDLING BULK OIL AND GASOLINE characterizes a new type river barge equipped at Leetsdale, Pa., plant of McClintic-Marshall Corp., subsidiary of Bethlehem Steel Corp., Bethlehem, Pa., for American Barge Line Co. Basically the barge is of the hopper type used in transporting cotton bales between Memphis and New Orleans; it is 158 feet overall, 11 feet deep and has 35-foot beam. To accommodate the cylindrical tanks, each 14½ feet in diameter and 40 feet long, the hopper was divided into three equal compartments, each having two tanks, side by side, with the necessary piping anchored securely in place. This arrangement precludes losses through leakage and provides for control of discharge of the cargo

Industry Should Study Welding

IN DISCUSSING the subject "Controlling Welding in the Structural Steel Fabricating Shops," Robert E. Kinkead, consulting engineer, Cleveland, urged members of the steel construction industry to profit from the lessons learned by the steel plate fabricators in the application of welding to their business.

"We have seen steel plate fabricators in the last 20 years go from practically all-riveted construction to

practically all-welded construction. The steel plate fabricator's business is similar to the structural steel fabricator's business in that the work is done, in most cases, to customers' specifications. The welding industry has profited very largely by this change. The steel plate fabricators have not profited by the introduction of welding into their business except in a few isolated cases.

"I do not see how we can consider control of welding in the structural steel fabricating business without recognizing the experience of the steel plate fabricators. There must be some reason why the welding industry made money from the plate fabricators and the plate fabricators acted as merely profit collectors for the welding industry."

In explaining this situation, Mr. Kinkead declared that the welding industry found out that its job was to sell welding to the steel plate fabricator's customers. They forced the fabricator to do welding whether he wanted to or not, so that in the end the fabricator lost control of his business. As soon as the fabricator or the welding industry found a new and better way of doing a job, the welding industry sold the scheme to the fabricator's customer, and the fabricator had to adopt it.

Mr. Kinkead said that steel plate fabricators were slow to acquire reliable information as to what a weld should be like, what it ought to cost, or what kind of service behavior should be expected of it. Because of this lack of knowledge, the plate fabricator had to rely heavily upon the welding industry, and again this was one of the reasons why he yielded control of his business. Mr. Kinkead's solution of the problem is for the structural steel fabricators to be better informed.

Furnishing Welding Information

"It seems obvious to me," he said, "that the collective purchasing power of the members of the Institute is a sufficiently powerful influence to control the welding industry's activities with the fabricator's customers. It does not seem beyond the bounds of reason that the institute can furnish its members with information about welding which will be accurate and authentic so that the members need only to rely on welding salesmen for information about their equipment and supplies. Further, the lookouts of the institute can warn the members several years in advance of probable changes in the requirements of welding construction so that their affairs may be conducted on a sound basis and they will not be disturbed over conditions about which they had no previous warning."

In conclusion, Mr. Kinkead said "the process by which you fasten pieces of metal together is the most vital part of your business. When, if, and as, this vital part of your business passes out of your control you become collectors of profit for someone else. Under present conditions you probably rivet 500 tons of steel for every ton of steel you weld together. But then, by the time the ratio is reversed and you are welding 500 tons of steel to every ton you rivet, the problem will have disappeared and you will be controlling your own business and operating it for your profit, or the welding industry will be using you as collectors of their profit."

Industry Is Becoming More Safety Minded

(*Concluded from Page* 49)

he pointed out. This has meant in single frame hammers the introduction of the high frame so that the operator might remain in an upright position. This change in design has been exceedingly beneficial, the new, high-frame hammers being more versatile than the old standard types and easily equipped with auxiliaries, for forging rings and other shapes, which were impossible in the old hammers.

In the larger sizes of double-frame forging hammers, the split frame, while not exactly new, deserves mention, said Mr. Miller, because it permits swedges and cut-off tools to be located in the center of the die without skewing the work and at the same time serving as a partial screen for the manipulator of the tools in question.

Safety gadgets are excellent things, but we must not lose sight of the fact that the workman will always be an accident risk unless he is trained to handle himself and the tools with which he turns out production daily, H. W. Boulton, director of personnel, Murray Corp. of America, Detroit, asserted at a session of the automotive and machine shop section. The accident-prone worker is a menace not only to the safety record of the plant but also to his fellow workmen.

No machine shop methods are complete unless they incorporate an active safety education program, he added, for effective work in the field of accident prevention consists of something more than mechanical guarding and the compiling of statistical reports. The workman must be impressed with his own safety responsibility, the foreman must handle the safety work from a supervisory and teaching standpoint, and the safety engineer must act as the follow-up man.

In a modern, properly managed industry the day of the "bawling out," when the worker was blamed in stentorian tones for every mishap, is a thing of the past, A. J. Martinson, safety supervisor, Union Oil Co. of California, Los Angeles, asserted at a session on maintaining interest in safety. Intelligent management now demands that the responsibility for every accident be determined accurately, that the situation be analyzed, and that the problem of discipline be worked out accordingly.

Mr. Martinson analyzed discipline as a factor designed to obtain prompt and efficient performance of every job, to the benefit of both the workman and the firm. With this in mind, he pointed out, it is wise to study every accident and to determine whether its cause is physical or supervisory. In the latter case, the foreman or superintendent may be to blame rather than the employe.

Improve Employer-Employe Relations, A.G.M.A. Says

(*Concluded from Page* 36)

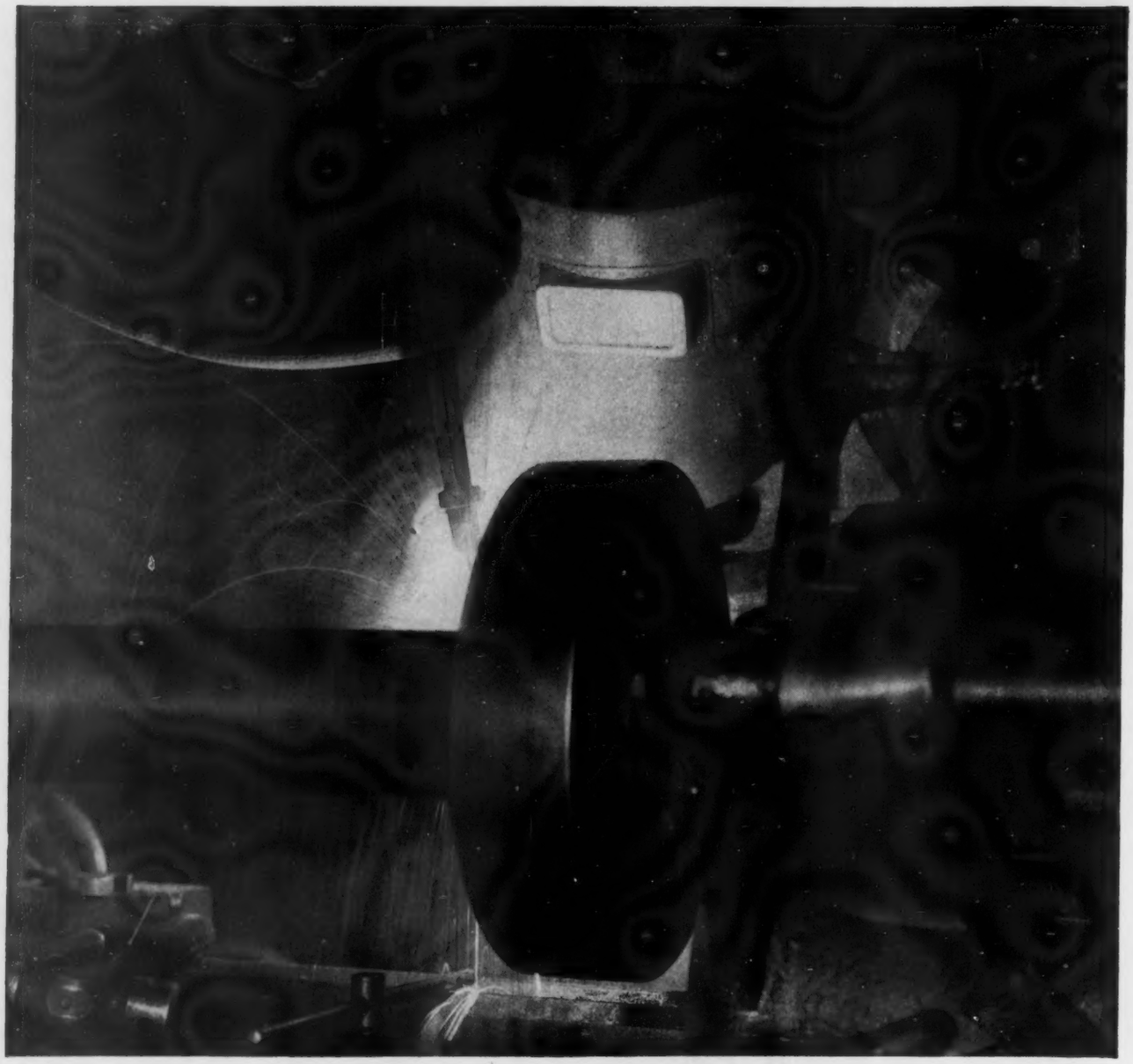
sign and operation of these types of gearing, the characteristics of the drives exerting a greater influence on durability, quietness and efficiency than the action of approach and recess. General agreement was expressed in discussion, though W. E. Sykes, Farrel-Birmingham Co. Inc., Buffalo, put forward the suggestion that for certain rapidly-accelerating drives greater care should be used in considering speed-increasing units than for speed decreasing.

Dealing with selection and heat treatment of gear materials, John Howat, Pittsburgh Steel Foundry Corp., Glassport, Pa. covered "Metallurgical Analysis of Gear Failures as Seen Through the Micrscope." One of the most important points brought out, both in the paper and discussion was that while failures of hardened gears ordinarily are ascribed to quenching strains, great harm may be done by incorrect heating—particularly if too rapid a heat is used. Proper length of time for tempering also was discussed, it being essential to allow sufficient time for transformation of grain size.

Four tentative standards were formally adopted by vote of the membership following presentation of technical progress reports by the chairmen of committees involved. One covered the recommended practice for tooth form as recently adopted by the American Standards association; another covered railway gearing; the third a proposed rating for gear units as utilized by the oil industry; and the fourth a recommended practice for nonmetallic gears and pinions.

President A. A. Ross announced that the 1936 annual meeting of the association would be held at Wilkensburg, Pa., the latter part of April, 1936.

Roebling — *the custom-made wire for exacting welders*



YOU can be certain that all Roebling Welding Wire...every bundle...every coil...every foot...will be uniformly of the same high quality. For it is a wire made specifically for welding purposes...by Roebling's special custom methods. This wire is absolutely uniform in quality and is free of non-metallic impurities. ¶ May we send you full information, prices, or samples? Available in electric and gas types; in a variety of straight lengths or in coils.

JOHN A. ROEBLING'S SONS CO., TRENTON, N.J.

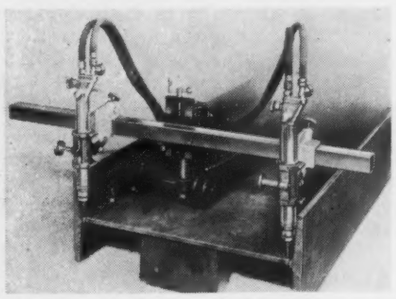
Branches in Principal Cities

ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

NEW EQUIPMENT

Torch Attachment—

Air Reduction Sales Co., 60 East Forty-second street, New York, is marketing a new I-beam splitting attachment — a simplified two-torch holder attachment designed primarily to adapt the company's radiagraph torch cutting equipment, when equipped with a beam splitting side roller attachment, for rapid splitting of I-beams of various sizes. Shown in an accompanying illustration, it is applied easily and quickly by sliding it onto the vertical mounting post in place of the standard single-torch holder arm. The side roller attachment is required because the flange of the beam is used to guide the travel of the equipment. When the torches are positioned on



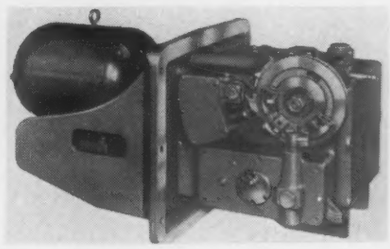
Two-torch holder attachment for splitting I-beams, product of Air Reduction Sales Co.

each side of the machine, the minimum spacing between torch centers is 10½ inches, maximum 36 inches. When positioned on the same side of the machine, the minimum spacing is 4 inches, maximum 15 inches.

♦ ♦ ♦

Hydraulic Unit—

W. F. and John Barnes Co., Rockford, Ill., is announcing a square ram hydraulic unit for drilling, boring, reaming, milling and similar metal-working operations. This compact, self-contained machine tool unit is being manufactured in two sizes, 3 and 5 horsepower. A feature is the hydraulic feed that provides an automatic operating cycle for the ram movement that includes rapid approach to work, feed, dwell if desired, quick return and stop. These movements are secured through an



Barnes indexing type hydraulic unit

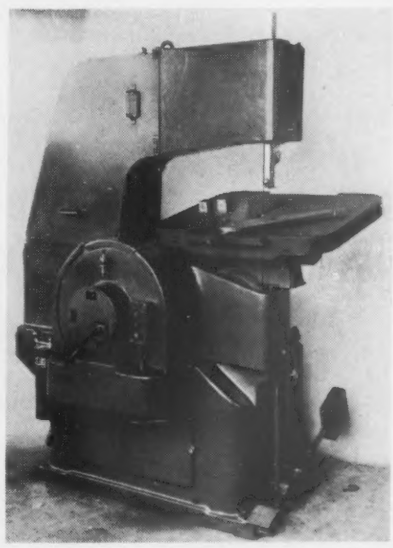
adjustable volume pump which supplies oil at high pressure for feed tools into the work, and a constant volume pump which supplies oil in large quantities for rapid traverses.

The accompanying illustration shows the company's new indexing type hydraulic unit designed for indexing and clamping work pieces and fixtures. It has adjustable control dogs, an automatic cycle and permits flange mounting.

♦ ♦ ♦

Open-End Bandsaw—

Grob Bros., West Allis, Wis., announce an improved bandsaw machine of the open-end type. Shown in the accompanying illustration,



Grob open end bandsaw machine is fitted with device which permits feeding in curves as well as straight lines

the new machine is equipped with a slide connected with a feeding device. The table slide is operated by an adjustable weight which is connected with an oil dashpot; the latter prevents feeding of the work at too rapid a rate. For instance, when sawing through a hole, the saw is fed slowly through the hole to prevent bumping of the work piece against the saw blade. A limit switch is connected to the feeding device in such a manner that the saw band cannot be reversed unless the weight has been taken off. The weight is operated by foot lever. In

Square D industrial circuit breaker now equipped with swing-out interior feature

connection with the table feed, a clamp has been developed which securely holds a die block of any shape; this clamp permits feeding of curves and also accurate feeding along a straight line.

♦ ♦ ♦

Circuit Breaker—

Square D Co., Detroit, has now applied the Square D swing-out interior feature to its 15-50 ampere frame industrial circuit breaker. The breaker unit is mounted on a metal pan which is hinged to the box. When the interior is in place it has the appearance of a conventional breaker, but by swinging it out and away from the box, the entire box area

Worthington portable compressor mounted on standard truck

may be used for bringing in conduit and wires without obstruction. This feature also provides open space between the rear of the box and the interior so that wires may be run underneath the base without danger of pinching them or damaging insulation.

♦ ♦ ♦

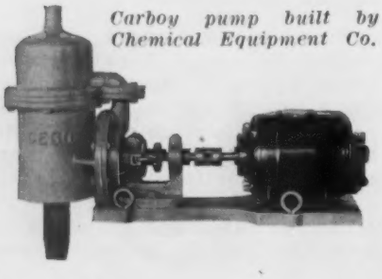
Truck-Mounted Compressors—

Worthington Pump & Machinery Co., Harrison, N. J., announces that its smaller sizes of two-stage portable compressors now are being installed on standard trucks. A typical installation is shown in the illustration directly above. The compressor, mounted rigidly on the truck frame, is driven through a power takeoff on the truck shaft through a multiple V-belt by the truck engine. A three-cylinder aircooled compressor with aircooled intercooler is used.

♦ ♦ ♦

Carboy Pump—

Chemical Equipment Co., Montpelier, Ind., has developed a carboy pump of the same design as its unit pump except that a priming tank is built directly on the suction head. This permits the pump, shown herewith, to be transferred from one carboy to another and immediately start pumping the liquid without additional priming. Design of the pump permits the base to be set on the carboy with the suction connection directly over the neck of the container, thus eliminating any pipe fittings or other connections. Spilling of acid on workmen and other such hazards are eliminated by the use of this pump which can be equipped with a flange connection into the side of the priming tank for connecting on to acid lines for circulating or pumping acids where small capacities and low head pressures are desired.

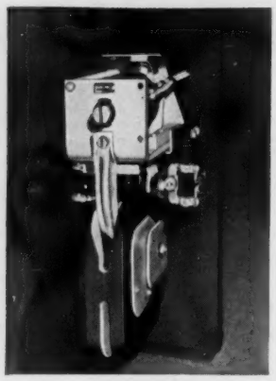


Carboy pump built by Chemical Equipment Co.

♦ ♦ ♦

Mill Type D.C. Contactors—

General Electric Co., Schenectady, N. Y., recently announced a new line of mill type direct-current contactors intended for the severe service encountered in steel mill applications. Designated as CR2800 contactors, they are equipped with "rocker" bearings which are practically unaffected by wear. The new units, one of which is shown herewith, are constructed of heavy rolled steel and are designed to facilitate inspection of parts.



General Electric mill type contractor

♦ ♦ ♦

Air-Gas Torch—

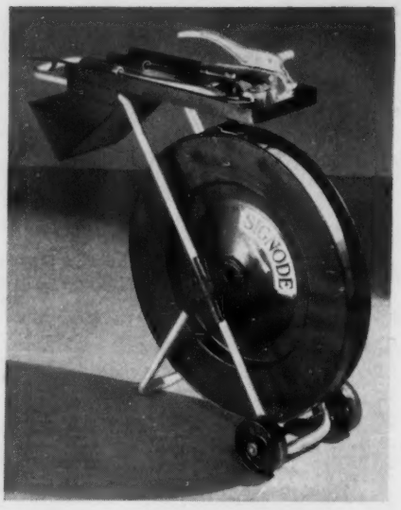
Torit Mfg. Co., 174 West Kellogg boulevard, St. Paul, has developed an improved air-gas torch that may be used with various kinds of gases such as natural gas, manufactured city gas, butane, propane, etc., in connection with compressed air. This torch, shown herewith, is designated No. 26 and is leakproof. It is designed so that the gas and air are thoroughly mixed, and to further increase efficiency, two tips are supplied.

Torit No. 26 air-gas torch

♦ ♦ ♦

Strapping Reel and Stand—

Signode Steel Strapping Co., 2600 North Western avenue, Chicago, is marketing a new strapping reel and stand of all steel and tube construction and built for heavy continuous shipping room service. One of the important features of the new unit, shown herewith, is the patented coil control that holds the strapping tight on the reel, releasing it as needed. When the desired length of strap has been drawn out the coil control stops the reel and holds the material ready for the next shipment to be strapped. Three combinations are furnished. The No. 10 reel includes a stand for seals, tools or small shipping units, and wheels for portability. The No. 9 comes without the stand and the No. 8 has neither stand nor wheels. This last named combination is extremely steady and serves best when the reel is to be used continuously in one place, the manufacturer points out.

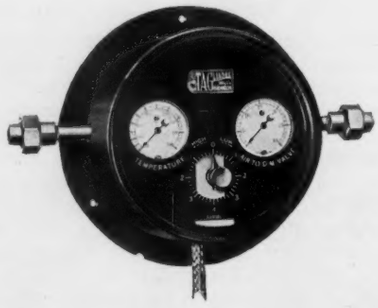


Signode steel strapping unit with reel mounted on wheels

♦ ♦ ♦

Controller—

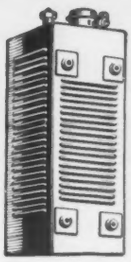
C. J. Tagliabue Mfg. Co., Park & Nostrand avenues, Brooklyn, N. Y., is announcing a new instrument to be known as its No. 40 controller. Suited to a number of automatic control applications, this unit is designed for compactness. The few simple parts are accessible with exceptional ease. A novel spring lever, designed to eliminate all lost motion, multiplies the movement of a powerful capsular spring for sensitive yet positive control. The smallest change in tem-



New Tag No. 40 controller

RUGGED

as only steel can be



The Edison is the only Storage Battery of American manufacture which is built of steel. Its electrolyte is alkaline, a steel preservative. All other storage batteries are lead-and-acid.

Edison-powered truck loading freight cars.

INDUSTRY demands a battery that's rugged—and gets it in one that's built of steel. Plates, poles, cell containers, cell covers—all structural parts of the Edison Battery are built of steel. The result is a more dependable storage battery that nets you savings two ways:

First, a steel battery does dependably the work it is supposed to do. Because it is not subject to sudden failure (as are all others) it does not tie-up costly operations.

Second, the per-year cost is lower because a steel battery lasts 2 to 5 times longer than ordinary types.

This advertisement is published to remind men who know steel that steel is the sturdiest material of which to build an industrial battery. Does your company use Steel Batteries?

EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

perature is transmitted positively and with precision to a ball air valve which in turn resets the rate of flow through a diaphragm actuated control valve. Indicating and non-indicating types in nine convenient temperature ranges and three pressure ranges are available in this new controller, shown on page 64.

♦ ♦ ♦

Outdoor Lighting Fixture—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is introducing an outdoor lighting fixture which

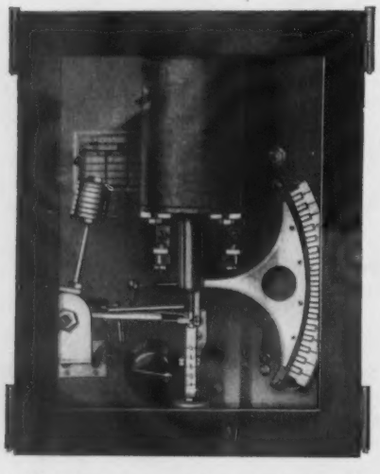
Pear-shaped globe produces symmetrical distribution of light

when used with the proper transformer may be equipped with a 4000 or 6000 lumen sodium lamp. Shown herewith, the unit consists of a cast aluminum body, with a clear rectilinear pear-shaped globe that produces symmetrical distribution of light.

♦ ♦ ♦

Voltage Adjuster—

Allis-Chalmers Mfg. Co., Milwaukee, is introducing its new V1 voltage adjuster to meet the demand for a voltage control unit for small alternators. The device, shown herewith, can be applied to alternating-current generators, varying in size from 5 kilovolt amperes at 360 revolutions per minute through intermediate kilovolt amperes and speed ratings up to 250 kilovolt amperes at 3600 revolutions per minute, where voltage regulator requirements are not too exacting. Small in size, the instrument embodies the "rocking contact" design and uses a solenoid operator in place of a torque motor.



Allis-Chalmers rocking contact voltage adjuster

♦ ♦ ♦

Tapping Attachment—

Ettco Tool Co., 594 Johnson avenue, Brooklyn, N. Y., is introducing a new tapping attachment for use on drill presses or any source of power with practical speeds up to 2000 revolutions per minute. Two sizes are available, No. 100 for 3/16-inch taps and No. 200 for ¼-inch taps maximum. The company announces that larger sizes will follow. Sensitive cone friction clutches are used to drive the tap. The entire mechanism is contained in an oil-tight case and operates in a pumped oil bath. Several styles of cases are furnished, with attaching means for portable drills, electric motors, special machines, etc.

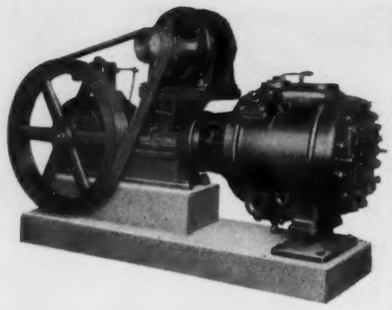
Left—Ettco-Emrick tapping attachment

Right — Lattner industrial gas flueless boiler

♦ ♦ ♦

Air Cushion Valve Vacuum Pumps—

Pennsylvania Pump & Compressor Co., Easton, Pa., is bringing out air cushion valve vacuum pumps, one of which is shown herewith. These units are of the straight line, single cylinder, roller bearing type, and can be furnished for both power and steam drive. Either single-stage or two-stage design is available, the former for handling air or gases in ordinary service, and the two-stage for higher volumetric efficiency and higher vacuum. In the two-stage pump, both stages are contained in one cylinder, the back or head being employed to exhaust the air or gas from the system and discharge it into the front or frame end of the cylinder where it is compressed and discharged to atmosphere or other point of disposal.

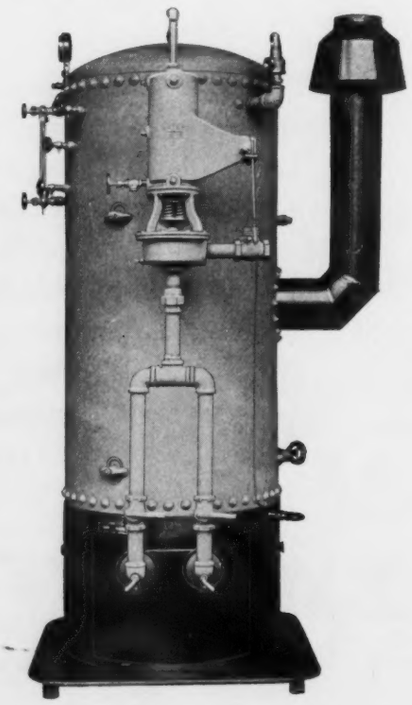


Pennsylvania dry vacuum pump

♦ ♦ ♦

Industrial Gas Flueless Boiler

P. M. Lattner Mfg. Co., Cedar Rapids, Ia., has placed on the market a new development in industrial gas boilers for process steam purposes. This unit, shown herewith, is of the internally fired water leg design, and employs a patented flueless heating surface in the furnace to obtain the required high thermal efficiency. Simplicity of design is a feature. By removing the burners and lowering the baffle all heating surface is exposed for inspection or cleaning. Cleaning the interior of the shell is accomplished by the same process as used with an ordinary vertical flueless shell. The new line of boilers is offered in sizes from 5 to 20 horsepower.



Forum on Modernization

(*Concluded from Page* 48)

wake up to the fact that the policy in force in many, if not a majority of plants, has been decidedly erroneous.

The automotive industry is a notable exception. Its executives are practically always ready to buy a new machine whenever a seller can show them, to their satisfaction, that it will pay for itself within the time which they consider its probable life in service and will show a profit on top of that. Furthermore, the seller usually can obtain a contact with someone who knows the manufacturing problem intimately, who will analyze the profit-earning possibilities intelligently and who, furthermore, if convinced by the seller, will immediately start the wheels turning to see that an appropriation is made for the purchase. Perhaps this is one reason why the automotive industry has shown such a striking revival and why it has been such a consistent profit-earner while so many other industries are at low ebb.

Aspects of New Equipment

In trying to get a general picture of the equipment exhibited at the Machine Tool Show it is difficult to figure where the greatest strides were made. There were almost countless examples of high-production machines for quantity manufacturing. These were specialized pieces of equipment, either in basic design or tooling, and often both. These pieces of equipment and the resulting low cost of production are the reason why we are able to maintain American standards of living in spite of high wage rates. Anyone who has quantity manufacturing that will justify special equipment has a pleasing prospect of cost reduction awaiting their investigation.

But even where this quantity manufacturing cannot be taken advantage of, the developments in general purpose machines provide a saving, by modernization, that is practically as great as on the special purpose machines.

The use of cemented carbide tools, so extensive on machine demonstrations, demands rigidity in the machine and cutting speeds which would have been fantastic ten years ago but which are practically universal on modern machines. Getting along without modern machines means excessive cost in comparison with competitors who have modernized.

The development of hydraulic drives is one of the most revolutionary trends. This sort of drive was a curiosity at the first Machine Tool Show and a novelty at the last one six years ago. At the current show the possibility of infinite variations in speeds, flexibility in power, variation in operating cycles, and the ability to move large masses at high speed without objectionable shock, was demonstrated so thoroughly that hydraulic drives have taken their well deserved place. One single manufacturer of hydraulic pump equipment published a list of 32 exhibitors using that particular make of pump; and this manufacturer by no means had the field to himself.

Another trend in machine design is the recognition of the demand for higher accuracy, so that quantity manufacturing and interchangeability can be maintained on a low cost basis and yet with an even higher quality of finished product. Any manufacturer who tries to meet competitive conditions as to quality of product, including quality of finish and minimum tolerances, on machines even five years old is liable to find himself in a difficult position. If the machine is ten years old the condition is impossible, even if the ten-year old machines are "as good as new."

Don't Forget Toolroom!

Another point that management should consider more carefully than is ordinarily done is the matter of toolroom and maintenance costs. Even where management is wide-awake in the matter of production costs and the value of modern equipment in the regular manufacturing, there is a disposition to consider the toolroom as a stepchild. It is fairly easy to appraise the possible savings of a production machine and it may be analyzed intelligently and, when warranted, may be purchased, but when it comes to the equipment of the toolroom, where costs are often charged to a general burden account, a niggardly attitude in regard to equipment purchases is prevalent.

Management should realize that, generally speaking, toolroom labor is more expensive than general production labor and the purchase of modern equipment for the toolroom means a saving of this expensive labor which is just as remunerative as is production labor. Furthermore, modern demands in the way of extreme accuracy are first met in the tooling program. To meet the modern demand for accuracy with anything other than modern tools calls for a waste of expensive labor.

No business which has available either cash or credit can afford to ignore lessons taught by the recent Machine Tool Show. Management is definitely charged with the responsibility of seeing that an intelligent policy is established at the top and that it permeates the whole organization, particularly including the officials charged with the responsibility of meeting equipment sellers. Where else can you find an investment that will yield 100 per cent per annum? Such earnings on modern equipment in comparison with obsolete equipment, are not at all exceptional—50 per cent or more is practically universal.

New Trade Publications

Sintered Carbide — Firth-Sterling Steel Co., McKeesport, Pa. A book of 32 pages devoted to Firthite sintered carbide cutting tools, with complete description and specifications.

Pyrometer—Bristol Co., Waterbury, Conn. A folder describing and illustrating its new wide-strip pyrometer, operating on the potentiometer principle.

Steam Trap—Yarnall-Waring Co., Chestnut Hill, Philadelphia. Circular T-1720, on its impulse steam trap, a device with only one moving part, designed for simplicity of action, with illustrations.

Compressors — Pennsylvania Pump & Compressor Co., Easton, Pa., Bulletin No. 164 on its 3-AT and 4-AT air cushion valve compressors, single-stage horizontal roller bearing type, illustrated in detail.

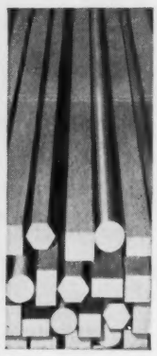
Variable Speed Control—Reeves Pulley Co., Columbus, Ind. A booklet, No. T-7025, showing typical applications of speed control units, results obtained; operating principle of the variable speed transmission is discussed.

Plating—Meaker Co., 129 South Fifty-fifth avenue, Chicago. Booklet on automatic plating and processing equipment, covering several types, explaining their applications, to assist manufacturers in selecting type best suited to their needs.

Press—Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. A leaflet describing and illustrating its safety bench power press for light assembling, riveting and foot press work, designed to reduce danger and fatigue.

Precision Bearings — Norma-Hoffmann Bearings Corp., Stamford, Conn. A bulletin on its precision needle roller bearings, a late addition to its line; designed for use where minimum outside dimensions, minimum weight, concentrated load capacity and high quality are requisites.

Belts—Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J. Bulletin 6508-B on its Condor compensated belt, showing numerous installations, charts and diagrams conveying technical data and explanation of construction and operation of this type belt.



Where Carbon-bar quality begins

THE characteristics of carbon-steel bars that determine their fitness for a given purpose originate in the open-hearth. Steel for Bethlehem Carbon Bars is made with a precision of open-hearth practice that is possible only in an organization with long experience in making fine steels. In the selection of materials, in the control of refining, science and mature human judgment work hand-in-glove to lay the foundation of Bethlehem Carbon-Bar quality on which customer satisfaction depends.

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

Heavy Pig Iron Demand Sustains Confidence

Merchant Shipments Setting Five-Year Record, as Steel Eases; Rate Down 1 Point

MARKET IN TABLOID

DEMAND . . . *Strong for pig iron; rising for automobiles; railroad, structurals slow.*

PRICES . . . *Iron, steel steady; scrap slightly easier; coke, fluorspar up.*

PRODUCTION . . . *Ingots down 1 point to 51 per cent. Tin plate 50 per cent; sheets 65 to 70 per cent.*

SHIPMENTS . . . *Heavier in raw materials.*

IN CONTRAST to heavier merchant pig iron shipments, which in the lakes districts are the largest for this period in five years, more hesitation has developed in new finished steel commitments, lowering the steelworks operating rate last week 1 point to 51 per cent.

Apparently the brake on steel is not due to any lack of specifications from automobile manufacturers, whose requirements are steadily increasing, but to further easing in demand from other sources, including tin plate, railroads, and structural material.

Automobile builders are finally facing the critical test in advancing introduction of new models, and while they are trying to get cars as rapidly as possible into dealers' hands, the question of how much support the steel industry may expect from this source over the remainder of the year will depend on the public's reception of those cars "out of season." Automobile production last week totaled 44,500, up 13,000 from the preceding week. Ford was negotiating for a substantial tonnage which may exceed its July purchases.

Tending to sustain confidence in the underlying soundness of the markets, however, is the sharply rising trend in merchant pig iron, demand being more than double that which producers forecast at the opening of this quarter.

At Chicago, where the steelworks rate has dropped 3 points to 55 per cent, a record movement of pig iron is under way, and indicative of steelmakers' expectations of a reversal of the present trend, another steelworks blast furnace has been lighted, while two more stacks are scheduled for this month. At Pittsburgh the steel rate has yielded 2 points to 46 per cent, but the leading producer is preparing to blow in another blast furnace.

The movement of scrap is slower, but mills at Chicago purchased 60,000 tons. Scrap exports to Europe are virtually suspended due to prohibitive vessel rates and Italy's refusal to pay cash. This has resulted in diverting eastern scrap to western territory. Price softness so far, however, has been restricted to Pittsburgh.

No inquiries are appearing for steel for war purposes. Steelmakers stocked heavily with manganese ore, and for the present are unaffected by a suspension of Russian shipments. The rise in vessel freights has led to an advance of $1 a ton in foreign fluorspar, with a corresponding rise in the domestic market.

Further adjustments in Connellsville coke, establishing prices 50 to 75 cents a ton above two weeks ago, follow increases in coal and coke workers' wages. Two important steelmakers now have before them petitions, emanating from employe representation groups, for a 15 per cent wage advance.

Price changes in finished steel are limited to an increase of $1 to $2 a ton in relaying rails, although in light rails certain size extras have been reduced.

Only the placing of 12,000 tons of structural shapes for Carnegie-Illinois Steel Corp.'s new Homestead, Pa., plate mill saved the total of awards in the week, 16,000 tons, from declining to the lowest point this year. For the Homestead mill 15,000 tons of castings and forgings also will be required. Concrete bar awards include 6000 tons for the Triboro bridge, New York.

For shelving in an addition to the Library of Congress, 2200 tons of sheets were purchased. Tin plate producers estimate a potential market of 300,000 tons for beer cans next year.

In addition to steelworks declines at Chicago and Pittsburgh, Buffalo was down 2 points to 50 per cent. Youngstown advanced 2 to 58; Cleveland 3 to 62; eastern Pennsylvania 1 to 38; others unchanged.

STEEL's iron and steel price composite is down 3 cents to $32.83. The finished steel index remains $53.70, while the scrap composite is off 4 cents to $12.71.

COMPOSITE MARKET AVERAGES

	Oct. 19	Oct. 12	Oct. 5	One Month Ago Sept., 1935	Three Months Ago July, 1935	One Year Ago Oct., 1934	Five Years Ago Oct., 1930
Iron and Steel	$32.83	$32.86	$32.83	$32.82	$32.44	$32.10	$32.35
Finished Steel	53.70	53.70	53.70	53.70	54.00	54.00	50.13
Steelworks Scrap	12.71	12.75	12.75	12.65	10.64	9.40	12.32

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Oct. 19 1935	Sept. 1935	July 1935	Oct. 1934
Finished Material				
Steel bars, Pittsburgh	1.85c	1.85c	1.80c	1.80c
Steel bars, Chicago	1.90	1.85	1.85	1.85
Steel bars, Philadelphia	2.16	2.11	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.40	2.40	2.60	2.60
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

	Oct. 19 1935	Sept. 1935	July 1935	Oct. 1934
Pig Iron				
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.81	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.31	19.26
No. 2 foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.68	20.68	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.75	24.25	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.67	18.80
Scrap				
Heavy melting steel, Pittsburgh	$13.75	$13.45	$12.30	$10.50
Heavy melt. steel, No. 2, east. Pa.	11.00	11.25	10.50	8.00
Heavy melting steel, Chicago	12.50	12.55	10.40	8.75
Rails for rolling, Chicago	14.00	13.90	11.25	9.90
Railroad steel specialties, Chicago	13.25	13.75	12.00	9.75
Coke				
Connellsville, furnace, ovens	$3.55	$3.25	$3.30	$3.60
Connellsville, foundry, ovens	4.35	4.00	4.25	4.60
Chicago, by-product foundry, del.	9.75	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 5 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
*Philadelphia.	2.06c
Pittsburgh, refined..	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05..
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight carloads; less than straight carloads take trade quantity extras; 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.	
Standard wire nails	$2.40
Cement coated nails	2.40
Galvanized nails, 15 gage and coarser	4.40
do. finer than 15 gage..	4.90

(Per pound)

Polished staples	3.10c
Galvanized fence staples	3.35c
Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 gage	2.30c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95

9250.....carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅛-in. Pittsburgh	1.85c
Chicago or Gary..	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del..	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-strip strip, Pitts., Cleve.	2.60c
Worcester, Mass..	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
*20-45 lbs.	$28.00
45-50 lbs.	$25.00
*50-60 lbs.	$26.00
*70-75 lbs.	$24.50
*80-90 lbs.	$26.00
*100 lbs.	$27.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll, qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base..	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	75 off
Rolled thread, ½ x 6, smaller	75 off

Machine Bolts

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts	75 off
Tire bolts	60 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	75 off
Step bolts	70 off
Elevator bolts	70 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	75 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland..	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, expect on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk.	Galv.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots or 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are uoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

*Connellsville, fur.	$3.55- 3.75
*Connellsville, fdry.	4.35- 4.50
*Connel., prem. fdry.	5.50- 5.75
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50
St. Louis, del.	10.00
Birmingham, ovens	6.00
Indianapolis, del.	9.25
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit; ov., out. del.	9.00
Philadelphia, del.	9.03
Terre Haute, Ind., del.	9.50

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol	15.00c	
Toluol	30.00c	
Solvent naphtha	30.00c	
Commercial xylol	30.00c	

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	20.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40,	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10,	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus $1.21	67c, 81c and switching charges		
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50,	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.50
Pitts. dist. fur.	18.00	Do., del. Chicago	24.75
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky. $55.00

First Quality

Pa., Ill., Md., Mo.... $45.00

Alabama, Ga.,Ky., $40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo. 40.00

Ga., Ala. 35.00

Ohio

First quality $40.00

Intermediary 37.00

Second quality 28.00

Malleable Bung Brick

All bases 50.00

Silica Brick

Pennsylvania $45.00

Joliet, E. Chicago.... 54.00

Birmingham, Ala.... 52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags).... $45.00

Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags).. 40.00

Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk).. 22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick $45.00

Chemically bonded chrome brick 45.00

Magnesite brick 65.00

Chemically bonded magnesite brick 55.00

Fluorspar, 85-5

*Washed gravel, duty paid, tide, net ton $20.00

*Washed gravel, f.o.b. Ill., Ky., net ton, carloads $15.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid 85.00

Do., Balti. base 85.00

Do., del. Pittsb'gh 90.13

Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†..... 26.00

Do., New Orleans 26.00

Ferrosilicon, 50% freight all., cl. 77.50

Do., less carload.. 85.00

Do., 75 per cent Spot, $5 a ton higher. 126-130.00

Silicoman., 2½ carb. 2% carbon, 95.00; 1%, 105.00 90.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.... 10.00

Ferrotungsten, stand., lb. con. del. 1.35- 1.45

Ferrovanadium, 35 to 40% lb., cont..... 2.70-2.90

Ferrotitanium, c. l., prod. plant, frt. allow., net ton 137.50

Spot, 1 ton, frt. allow., lb. 7.00

do., under 1 ton.... 7.50

Ferrophosphorus, per ton, c. l., 17,-19% Rockdale, Tenn., basis, 18%, $2 unitage 50.00

Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage 65.00

Ferromolybdenum, stand. 55-65%, lb. 0.95

Molybdate, lb. cont. 0.80

†Carloads, Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: Futures	Lead: N. Y.	Lead: East St. L.	Zinc: St. L.	Aluminum: 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Oct. 12	Holiday										
Oct. 14	9.25	9.37½	8.85	54.00	51.00	4.50	4.35	4.85	*19.00	15.75	35.00
Oct. 15	9.25	9.37½	8.85	52.87½	50.62½	4.50	4.35	4.85	*19.00	15.75	35.00
Oct. 16	9.25	9.37½	8.85	51.50	49.62½	4.50	4.35	4.85	*19.00	16.75	35.00
Oct. 17	9.25	9.37½	8.85	51.87½	49.75	4.50	4.35	4.85	*19.00	16.75	35.00
Oct.18	9.25	9.37½	8.85	50.75	48.75	4.50	4.35	4.85	*19.00	16.37½	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets

Yellow brass (high)	14.62½
Copper hot rolled....	16.25
Lead cut to jobbers	8.25
Zinc, 100-lb. base....	9.50

Tubes

High yellow brass	16.62½
*Seamless copper....	16.75

Rods

High yelow brass	13.12½
Copper, hot rolled....	13.50

Anodes

Copper untrimmed..	14.00

Wire

Yellow brass (high)	15.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	5.75- 6.00
Cleveland	5.87½-6.12½
Chicago	6.00-6.12½
St. Louis	6.00- 6.25

Heavy Copper and Wire

New York, No. 1.....	7.00- 7.25
Chicago, No. 1	7.00- 7.25
*Cleveland	6.75- 7.00
*St. Louis, No. 1	7.25- 7.37½

Composition Brass Borings

New York	5.50- 5.75

Light Copper

New York	6.00- 6.25
Chicago	5.50- 5.75
Cleveland	5.75- 6.00
St. Louis	6.00- 6.25

Light Brass

Chicago	3.25- 3.50
Cleveland	3.12½-3.37½
St. Louis	3.50- 3.75

Lead

New York	3.50-3.87½
Cleveland	3.25- 3.50
Chicago	3.50- 3.75
St. Louis	3.75- 3.85

Zinc

New York	2.50- 2.75
Cleveland	2.50- 2.75
St. Louis	2.75- 3.00

Aluminum

Borings, Cleveland	8.50- 9.00
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast. St. L....	13.00-13.50
Clips, soft, Cleve....	14.75-15.00

SECONDARY METALS

Brass ingot, 85-5-5-5	9.25
*Stand. No. 12 alum.	17.00-17.25

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dock, expt.	9.00- 9.25
Boston, domestic	7.50- 7.75
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.75
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.25- 8.75
Eastern Pa., No. 1	12.00
Eastern Pa., No. 2	11.00
Federal, Ill.	9.25- 9.75
Granite City, R. R.	10.50-11.00
Granite City, No. 2	8.75- 9.25
N. Y., deal, No. 2	7.50- 7.75
N. Y., deal, barge	8.50- 8.75
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)	13.50-14.00
Pittsburgh, No. 2	12.25-12.75
St. Louis	8.50- 9.00
Valleys, No. 1	13.00-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.50-11.00
Chicago, factory	11.50-12.00
Chicago, dealer	10.25-10.75
Cleveland	11.50-12.00
Detroit	10.00-10.50
E. Pa., new mat.	11.50-12.00
Pittsburgh	13.25-13.75
St. Louis	6.25- 6.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	8.00- 8.50
Cincinnati, del.	7.50- 8.00
Cleveland	9.50-10.00
Pittsburgh	12.00-12.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati	7.00- 7.50
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	14.50-15.00
Chicago (3 ft.)	14.00-14.50
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	13.50-14.00
Detroit	12.50-13.00
Pitts., open-hearth, 3 ft. and less	16.00-16.50
St. Louis, 2 ft. & less	13.25-13.75

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	12.25-12.75
Pittsburgh	14.25-14.75
St. Louis	11.50-12.00
Buffalo	12.00-12.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	3.50- 3.75
Buffalo	10.25-10.75
Chicago	8.00- 8.50
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.00- 7.50
Eastern Pa.	9.50
N. Y., deal. fdry.	6.00
St. Louis	8.00- 8.50

COUPLERS, SPRINGS

Buffalo	14.25-14.75
Chicago, springs	13.50-14.00
Eastern Pa.	14.50-15.00
Pittsburgh	16.00-16.50
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	13.00-13.50
St. Louis	12.00-12.50

RAILROAD SPECIALTIES

Chicago	13.00-13.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.25-14.75
Cleveland, billet, bloom crops	15.00-15.50
Eastern Pa., crops	15.50-16.00
Pittsburgh, billet, bloom crops	16.50-17.00
Pittsburgh, sheet bar crops	15.50-16.00

FROGS, SWITCHES

Chicago	12.25-12.75
St. Louis, cut	11.50-12.00

SHOVELING STEEL

Chicago	12.25-12.75
Federal, Ill.	9.25- 9.50
Granite City, Ill.	8.75- 9.25

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	12.00-12.50
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	12.25-12.75
Cincinnati, No. 2	9.50-10.00
Eastern Pa.	12.00-12.50
N. Y., No. 1, deal	9.50-10.00
St. Louis, No. 1	6.75- 7.20
St. Louis, No. 2	10.25-10.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	10.00
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	11.00-11.50
Cinci., No. 1, deal	7.50- 8.00
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.25-12.75

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	3.25- 3.50
Buffalo	5.75- 6.25
Chicago	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Cleveland	7.75- 8.25
Detroit	5.25- 5.75
Eastern Pa.	7.50- 8.00
New York, dealers	3.75- 4.00
Pittsburgh	9.75-10.25
St. Louis	2.25- 2.75
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.50- 8.00
Cincinnati, dealers	5.00- 5.50
Cleveland	8.00- 8.50
Detroit	6.50- 7.00
Eastern Pa.	6.00- 6.25
New York, dealers	1.50- 1.75
Pittsburgh	8.50- 9.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	8.00- 8.50
Detroit	5.75- 6.25
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	5.50- 6.00
Eastern Pa.	9.00- 9.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.75- 6.00
Buffalo	10.50-11.00
Cleveland	10.00-10.50
Detroit	8.50- 9.00
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston, dealers	4.50- 5.00
Chicago, heavy	13.50-14.00
Eastern Pa.	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	12.00-12.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Eastern Pa.	11.00
St. Louis	7.75- 8.25

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.50-11.00
Buffalo	14.50-15.00
Chicago, net	14.50-15.00
Eastern Pa.	17.00
St. Louis	12.50-13.00

SHAFTING

Boston, ship point.	13.00-13.25
Eastern Pa.	18.50
New York, dealers	13.25-13.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00-10.00
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	14.50-15.00
Chicago, iron	12.50-13.00
Chicago, rolled steel	13.00-13.50
Cincinnati, iron	10.00-10.50
Eastern Pa., iron	12.50-13.00
Eastern Pa., steel	14.50-15.00
Pittsburgh, iron	14.00-14.50
Pittsburgh, steel	15.50-16.00
St. Louis, iron	10.00-10.50
St. Louis, steel	12.00-12.50

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 1 mach.	9.00- 9.25
Boston, No. 2	8.00- 8.25
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	12.25-12.75
Buffalo, mach.	13.00-13.50
Chicago, agri. net	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, mach. net	11.50-12.00
Chicago, railr'd net	10.00-10.50
Cinci., mach. cup	10.00-10.50
Cleveland, cupola	12.25-12.75
Detroit, net	10.00-10.50
Eastern Pa., cupola	12.50-13.00
E. Pa., mixed yard	10.50
Pittsburgh, cupola	14.00-14.50
San Francisco, del.	13.50-14.00
Seattle	7.50- 9.00
St. Louis, No. 1	9.50-10.00
St. L., No. 1 mach.	11.75-12.25

HEAVY CAST

Boston, del.	6.00- 6.25
Buffalo, break.	10.50-11.00
Cleveland, break	10.00
Detroit, No. 1, mach. net	12.00-12.50
Detroit, break.	8.50- 9.00
Detroit, auto net	11.50-12.00
Eastern Pa.	11.50
N. Y., break. deal	6.75- 7.25
Pittsburgh	13.00-13.50

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	13.50-14.50
Buffalo	14.00-15.00
Chicago, R. R.	14.50-15.00
Cincinnati, agri. del.	11.00-11.50
Cleveland, rail	15.50-16.00
Detroit, auto net	12.50-13.00
St. Louis, R. R.	13.00-13.50
Eastern Pa., R. R.	13.00-13.50

RAILS FOR ROLLING

5 feet and over

Birmingham	11.50-12.00
Boston, dealers	8.00- 8.50
Buffalo	12.00-12.50
Chicago	13.75-14.25
Eastern Pa.	13.00-14.00
New York, dealer	10.50-11.00
St. Louis	12.25-12.75

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	11.75-12.25

LOW PHOS. PUNCHINGS

Buffalo	14.25-14.75
Chicago	14.50-15.00
Eastern Pa.	15.00-16.00
Pittsburgh (heavy)	16.00-16.50
Pittsburgh (light)	15.00-15.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.05c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.70c
San Francisco	3.45c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c

REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.46c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland (i)	3.70c
San Francisco	3.45c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ¼-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.30c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ¼-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL	
Baltimore (c)	3.58c
Boston	3.75c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.87c
Tulsa	4.50c

COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c

TOOL STEELS (Applying on or east of Mississippi river; west of Mississippi 1c up)	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS (100 pounds or over)	Discount
Chicago (a)	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70-10-5

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 inches; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic bars. *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 17

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports			Continental Channel or North Sea ports, metric tons	
PIG IRON		£	s d	Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.41	3	2 6	$14.17	1 15 0
Basic bessemer	15.41	3	2 6*	12.95	1 12 0
Hematite, Phos. .03-.05	16.02	3	5 0	.....	.....
SEMIFINISHED STEEL					
Billets	$27.12	5	10 0	$19.02	2 7 0
Wire rods, No 5 gage	41.90	8	10 0	36.44	4 10 0
FINISHED STEEL					
Standard rails	$40.67	8	5 0	$44.53	5 10 0
Merchant bars	1.65c	7	10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.62c	7	7 6	1.14c	3 1 6
Plates, †¼ in. or 5 mm	1.76c	8	0 0	1.56c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.04c	9	5 0	2.13c	5 16 0††
Sheets, gal., 24 gage, corr.	2.59c	11	15 0	2.28c	6 5 0
Bands and strips	1.87c	8	10 0	1.46c	4 0 0
Plain wire, base	2.04c	9	5 0	1.96c	5 7 6
Galvanized wire, base	2.36c	10	15 0	2.29c to 2.33c	6 5 6 to 6 7 6
Wire nails, base	2.64c	12	0 0	2.11c	5 15 0
Tin plate, box 108 lbs.	$ 4.44	0	18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£	s	d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.64	3	7	6(a)	$17.13	260	$12.46	370	$25.34	63
Basic bessemer pig iron	17.25	3	10	0(a)	12.52	190	11.12	330	27.96 (b)	69.50
Furnace coke	4.19	0	17	0	6.26	95	3.88	115	7.64	19
Billets	27.12	5	10	0	28.34	430	18.20	540	38.82	96.50
Standard rails	1.82c	8	5	0	2.08c	694	1.65c	1,100	2.42c	132
Merchant bars	1.89c	8	12	0	1.68c	560	.90c	600	2.01c	110
Structural shapes	1.93c	8	15	0	1.65c	550	.90c	600	1.97c	107.50
Plates, †¼-in. or 5 mm	1.99c	9	1	3	2.10c	700	1.05c	700	2.32c	127
Sheets, black	2.42c	11	0	0§	1.80c	600‡	1.24c	825‡	2.64c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.86c	13	0	0	3.23c	1,075	2.25c	1,500	6.77c	370
Plain wire	2.04c	9	5	0	3.15c	1,050	1.73c	1,150	3.17c	173
Bands and strips	2.06c	9	7	0	1.95c	650	1.26c	840	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.25 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh—Commercial steel bar bookings here are steady, reflecting a fair volume of business of miscellaneous origin, plus slightly better volume from the automotive field, the latter in both alloy and carbon grades. An important purchase of bars is expected to have been completed this week by a leading automobile maker. The market continues 1.80c, Pittsburgh.

Cleveland—Larger automobile releases have served to increase the tonnage of bars now being specified, but leading makers report the volume still is predominantly miscellaneous. Automobile forge shops are more active, and some substantial orders also have been received from manufacturers of automobile springs. Nut and bolt makers are increasing operations and this is reflected in more orders for bars. Builders of road machinery are not as active as in September and demand from agricultural implement manufacturers also is slower. Prices are steady.

Chicago—Automotive bar releases are in moderate volume. Occasional recessions are noted in specifications from miscellaneous consumers though the total tonnage is fairly steady. Farm implement manufacturers are maintaining active schedules and no slackening is in sight in steel requirements of this group.

Boston—Buying of commercial steel bars continues slack, small lots predominating, some mills meeting requests for immediate delivery with difficulty. Releases against contracts are somewhat heavier. Forging and alloy bars are relatively more active than other grades. On new volume 1.85c, Pittsburgh, is generally done.

Philadelphia — Notwithstanding protective covering last month before the application of the new quantity extras and deductions on bars, bar sellers report that a fairly good amount of new tonnage is being placed, as consumption is still expanding. Common iron bars also are moving in fair volume, with prices unchanged since the first of the month.

Cold Finished

Cold Finished Prices, Page 71

Pittsburgh—Cold-finished steel bar specifications are slightly better and shipments continue at a high rate; the latter in view of heavier buying just before the Oct. 1 change in extras. The farm implement trade now appears to be definitely slackening in its cold-finished bar specifications with an increase in commitments not expected much before December. The market holds at 1.95c, base, Pittsburgh.

Plates

Plate Prices, Page 70

Pittsburgh—Private inquiry for steel plates which might be promising is absent, and barge yards have only about 400 tons of plates to figure on in four dump scows to be bid to army engineers here Oct. 26, and a small but unstated tonnage in a steel hull pusher boat for Nov. 13 to Pittsburgh army engineers. Plates remain based at 1.80c, Pittsburgh.

Cleveland—Demand is fairly active for plant rehabilitation work but orders are relatively small. Some manufacturers in this district are figuring on various items of equipment which will be required for the Carnegie-Illinois Steel Corp.'s new mill at West Homestead, Pa., the general contract for which has been awarded.

Chicago—Plate business is largely miscellaneous, few large tonnages being booked for individual projects. Specifications from structural fabricators are fairly steady but new awards are light. Tank work is slow to improve, while action is not taken on several pipe lines now pending. Only small lots are moving to railroad shops and freight car builders.

Boston—With the exception of heavy shipyard requirements, most plate tonnage is still largely for small miscellaneous lots, such volume holding to the recent current rate. An increase in water tank and standpipe needs is also an encouraging factor, several such projects being planned for early bids. Prices are steady at 2.22c, Boston.

New York—Plate specifications are still spotty although the general volume is slightly improved. Hull steel totaling about 6500 tons for a navy cruiser still is pending. Bids on the proposed liner for International Mercantile Marine-Roosevelt Steamship Co., previously mentioned as requiring 15,000 tons of hull steel, will be opened Nov. 12, award to be made by Dec. 16. Platemakers are interested in the award of 2200 tons of 3/16-inch material by Snead & Co., Jersey City, N. J.

Philadelphia—Navy work still occupies the principal interest of platemakers, with one opening last week and several additional schedules up for figuring shortly. A substantial proportion of the tonnage involves galvanizing and bidding is said to be complicated. The Pennsylvania railroad is placing some scattered specifications for car repairs and the Norfolk & Western is now actively inquiring for 6000 to 7000 tons of steel for new cars to be built in its own shops at Roanoke, Va. Lancaster Iron Works Inc., Lancaster, Pa., has booked 400 lengths of 20-inch riveted pipe, well over a mile, for the United States Engineer at Galveston, Tex.

Tank fabricators are figuring a large tonnage for an elevated tank at Newport News, Va.

San Francisco—Thompson Mfg. Co., Denver, is low bidder at $164,000 for five siphons for Denver, calling for 900 tons of steel plates. Standard Oil Co., San Francisco, has awarded the general contract for a steam power plant at its Richmond, Calif., refinery, to Stone & Webster Engineering Co., San Francisco, at $1,800,000. A heavy tonnage of plates and shapes will be required. Bids have been opened on 2500 to 3200 tons for tanks for the Hopi valley irrigation district, Fort Defiance, Ariz.

Seattle — Plate fabricators and boiler shops report improved business. Small jobs are increasing and the outlook is more promising. Puget Sound Machinery Depot, Seattle, has been awarded the Everett, Wash., pipe line, requiring about 1000 tons of plates, the type of pipe not yet having been settled. Tacoma opened bids Oct. 18 for the second unit of the Green river water line extension, costing $467,000 and including 900 to 1250 tons of plates, depending on type adopted. The third unit, to cost $540,000 and calling for approximately 1200 tons of plates, will be up for figures soon.

Contracts Placed

1000 tons, Everett, Wash., pipe line extension, to Puget Sound Machinery Depot, Seattle.

130 tons, 30 and 37-inch O. D. steel pipe, replacing 1200 feet of 36-inch cast iron, capitol power plant, Washington, to Alco Products Inc., Dunkirk, N. Y.; bids Oct. 4.

Unstated tonnage, 400 lengths, 6800 feet, 20-inch riveted steel shore pipe, United States engineer, Galveston, Tex., to Lancaster Iron Works Inc., Lancaster, Pa.

Contracts Pending

1200 tons, Tacoma water system improvement; schedule No. 3; bids soon.

900 tons, five siphons, Denver; Thompson Mfg. Co., Denver, low at $164,000.

900 to 1250 tons, Tacoma water system improvement; bids in.

Unstated tonnage, one steel hull pusher boat for federal engineers, Pittsburgh; bids Nov. 13.

Buys Aluminum Alloy

Boston — Aluminum Company of America has been awarded 200,000 pounds aluminum alloy for the Portsmouth, N. H., navy yard at 19c, delivered, on bids Oct. 1 to the bureau of supplies and accounts, Washington.

Transportation

Track Material Prices, Page 71

Steelmakers look for car repair work rather than new car construction to provide the principal improvement this year once the 6000 tons of steel for cars to be built by the Norfolk & Western are awarded. Increased traffic is emphasizing the shortage of equipment in good repair. One large carrier is refusing to let coal cars go off its line. Many roads hold cars in good repair from other lines and pay the penalty charge, so acute has become the shortage. The Pennsylvania may bring out inquiries before the end of the year for a substantial lot of equipment.

Brazil has placed 1500 tons of rails with a Pittsburgh mill. The Wheeling & Lake Erie is reported to have placed 500 tons of rails with a Pittsburgh producer. New York board of transportation will open bids Oct. 22 on 400 tons of trailer wheels. A Detroit buyer is negotiating for 300 tons of girder rails. A carlot of 18-8 stainless steel is pending for the bullion depository at Fort Knox, Ky.

Lehigh Coal & Navigation Co. is inquiring for a minimum of 60 and a maximum of 100 all-steel mine cars, each of about 140 cubic foot capacity. Bids are expected to be closed on about Nov. 1. Reading railroad is building 100 specially designed all-steel "shock proof" box cars for automobile freight at its Reading, Pa., shops.

Carnegie-Illinois Steel Corp. expects to begin production probably this week on a rail order backlog made up chiefly of about 13,000 tons for the Chesapeake & Ohio.

Carnegie-Illinois Steel Corp. will require about 8000 lineal feet of standard gage track work in connection with construction of its new 100-inch semi-continuous sheared plate mill at Homestead, Pa.

Light rails and relaying rails, according to sellers at Pittsburgh, have been in exceedingly heavy demand the past few weeks. Buying is for repair of railroad spur lines, mines, and other uses.

Prices have advanced on all the weight section classifications of relaying rails, with the following markets now reported: 20 to 45-lb. sections, $28, Pittsburgh; 45 to 50-lb., $25; 50 to 60-lb., $26; 70 to 75-lb., $24.50; 80 to 90-lb., $26; 100-lb., $27.

The market on new billet quality light rails remains $35, Pittsburgh, but certain changes have been made in extras for weight. The extra, formerly $5, for 50 to 60-lb. has been reduced $3 and the extra for 12-lb. is now $2, also. Base continues to be weights 25 to 40 pounds with the extra unchanged at $1 for 16 to 20-lb. and 8 and 10-lb. sections unchanged at an extra of $5. The extra for cut lengths of $2, which applies to 15-foot sections, also is unchanged.

Prices on standard rails hold at $36.375 per ton, mill, spikes at 2.40c, track bolts, 3.55c, and tie plates, 1.90c, base.

Buses Booked

American Car & Foundry Motors Co. New York: Ten city coaches for Memphis Street Railway, Memphis, Tenn.; two city coaches for Fitchburg & Leominster Street Railway, Fitchburg, Mass.; two city coaches for Worcester Street Railway, Worcester, Mass.; one city coach for Reading Transit Co., Reading, Pa.; three city coaches for Syracuse Co-ordinated Bus Line Inc., Syracuse, N. Y.

Sheets

Sheet Prices, Page 70

Pittsburgh—Led by a representative volume of miscellaneous sheet specifications, practically all for immediate shipment, the market displayed a stronger tone last week than in the week preceding. Barrel and drum manufacturers, as well as the farm implement trade and makers of small boilers, were outstanding purchasers. In the automobile sheet market the requirements of a large purchaser in Detroit were figured last week; the prospective purchase amounting to several thousand tons. Operations in the sheet mills were steady at about 50 per cent of capacity for the jobbing branch, and 65-70 per cent for others. Galvanized sheet output is at about 75 per cent. Base prices are unchanged.

Cleveland — Sheet demand is mounting rapidly, as fresh automobile specifications are received. The Cleveland mill is operating at capacity, and a nearby lake mill, serving the Michigan automobile district is working at 80 per cent. These producers are encouraged by the fact that still heavier specifications are anticipated as automobile production increases. Practically all makers of household utilities, such as refrigerators, washing machines and stoves, are active and specifying regularly. Prices are firm.

Boston—Sheet buying by industrial and miscellaneous consumers, including small tank fabricators, is steady, although there has been some decline in new volume for galvanized. Prices are firm, and seconds apparently are less an unsettling factor in this district than in other eastern consuming points.

Chicago—Sheet demand is steady and production continues at a relatively high level. Backlogs are sufficient to support schedules for several weeks on most grades, and indications point to fairly heavy output for the balance of the quarter. Automotive releases show some improvement, though tonnages involved are expected to be exceeded materially within the next three to four weeks. Miscellaneous sheet demand is well maintained.

New York—Sheet business is brisk, with deliveries gradually being extended. Most sellers now are offering two to three weeks on hot rolled and four weeks or more on cold finished, particularly wider sizes. For an addition to the Library of Congress, Washington, 2200 tons of 3/16-inch sheets have been purchased through Snead & Co., Jersey City, N. J., from American Rolling Mill Co., Middletown, O.

Philadelphia—Further substantial specifications for autobody sheets, combined with good releases from radio manufacturers, are contributing to a brisk sheet market here. Stovemakers, however, are specifying less freely. Maryland has closed on 320 tons of 22-gage hot rolled, pickled sheets for automobile license tags with two Baltimore warehouse companies, the Seaboard Steel & Iron Corp., and William A. Conway. The price was 2.98½c, Baltimore. New bids were opened Oct. 17 by the state of Pennsylvania, forest and water division, on 9200 feet of culvert pipe, to be made of galvanized sheet steel.

Buffalo—Sheet mills here are operating at 80 per cent, and booked ahead sufficiently to indicate they will work at this rate until December.

Cincinnati—Specifications to district sheet mills from automobile manufacturers show an upward trend. Needs of refrigerator makers also are heavier, with other demand steady. Peak shipments on galvanized are evidently past for the year. Prices are steady.

St. Louis—Producers and distributors report new ordering and shipments steady. Galvanized material leads in demand with the movement of roofing material to the South in considerable volume. Prices are firm.

Birmingham, Ala.—Sheet mills at Fairfield and Gadsden are producing actively and shipping at the same rate. Efforts to broaden markets are bearing results, and future prospects are reported bright.

Seattle—Light gages are in good demand for seasonal repair work. General construction is slow and requirements in that field are small.

Struthers-Wells Co., Warren, Pa., has opened an office at 1838 Euclid avenue, Cleveland, in charge of B. W. Rogers and P. M. Kline, to represent them in the Cleveland district.

Pipe

Pipe Prices, Page 71

Pittsburgh—Several line pipe projects are slow to reach the contract stage, and demand is limited to small lots. This is sufficient, however, to engage productive capacity at about 45 per cent. Evidence of many industrial and railroad repairs is noted in specifications which are placed for boiler tubes and standard pipe, but oil country goods are taking a fair share of pipe and the automotive industry is a steady consumer of mechanical tubing. About 600 tons of pipe and fittings will be required for the Carnegie-Illinois Steel Corp's Homestead, Pa., plate mill, on which design will soon be completed. All discounts on tubular products are steady.

Chicago—Outlook for better business in cast pipe is improved by activity in hastening the taking of bids and placing of orders for projects sponsored by federal funds. So far this move has resulted in but few orders, but a pickup in bookings is looked for shortly. Chicago is taking bids on 406 tons of 24-inch pipe.

Boston—Contracts for corrugated metal culvert pipe for federal works program highway projects in Maine, bids Oct. 1, were awarded three sellers, Bancroft & Martin Rolling Mills Co., South Portland, Me., and New England Metal Culvert Co., Portland, to furnish 42½ per cent of the total each, Berger Metal Culvert Co., Boston, to supply 15 per cent. Merchant steel pipe demand is steady and slightly heavier. Cast pipe buying continues to drag, and, while considerable work has been approved in the way of waterworks extensions, little new volume has come out for bids.

Birmingham, Ala.—Market is showing additional strength and expectations are strong for a heavy influx of business growing out of announcement that deadline on PWA projects is Dec. 15, by which time actual construction must be under way. Many shops here are in shape to handle a material increase in output. Base price of pipe is maintained, $39-$40 on 6-inch and over.

San Francisco—Cast iron pipe awards are confined to lots of less than 100 tons. Torrey, Utah, has taken bids on 131 tons of 2 and 4-inch pipe.

Seattle—Extension and replacement projects are developing more rapidly as federal funds are being allotted. J. M. DeBlasio, Yakima, Wash., has the general contract for water system improvement at Mabton, Wash., involving 300 tons of 4, 6 and 8-inch class 150 cast pipe, awarded to H. G. Purcell, Seattle for the United States Pipe & Foundry

NEW POT-TYPE ANNEALING FURNACE

permits greater flexibility and fuel savings

A NEW IDEA in pot annealing is provided by this insulated steel Pot Furnace, built by Continental Industrial Engineers, Inc., Chicago. It consists of a cylindrical shell of 9" Armstrong's EF-22 Insulating Fire Brick backed up with 4½" Armstrong's Insulating Brick, all enclosed in a rugged steel shell which is attached to a steel dome.

Light in weight, this furnace is especially suited for continuous operation. After one pot has been heated the shell is lifted and lowered around another. To speed cooling, a light steel shell with water spray is lowered onto the pot after the insulated furnace shell is removed.

Use of Armstrong's EF-22 Insulating Fire Brick makes possible lighter, thinner walls. And it does more! Because this brick requires no fire brick protection, it cuts down the time needed to bring furnace walls to temperature, saves on fuel bills.

Armstrong's EF-22 Insulating Fire Brick is efficient up to 2200° F. behind the refractory. Other insulating and insulating fire brick made by Armstrong are listed at right. Samples and data on any or all will gladly be sent on request. Address Armstrong Cork Products Co., Building Materials Division, 985 Concord Street, Lancaster, Pa.

Furnace for pot annealing under conditions of controlled atmosphere, built by Continental Industrial Engineers, Chicago.

High Temperature Products in Armstrong's Complete Insulation Line include:

Armstrong's N-16 Insulating Brick for temperatures up to 1600° F. behind the refractory.

Armstrong's N-20 Insulating Brick for temperatures up to 2000° F. behind the refractory.

Armstrong's A-25 Insulating Brick for temperatures up to 2500° F. behind the refractory.

Armstrong's EF-22 Insulating Fire Brick. Light-weight semi-refractory brick for direct exposure up to 2200° F.

Armstrong's EF-26 Insulating Fire Brick for direct exposure up to 2600° F.

Armstrong's V-18 Block. Insulating block for use up to 1800° F.

Armstrong's

HIGH TEMPERATURE INSULATION

Co., Burlington, N. J. Sultan and Kettle Falls, Wash., are asking bids for water system extensions while Conrad, Mont., has $138,000 available for a pipeline project. Four water system projects in the Hawaiian islands total more than $1,500,000.

Cast Pipe Placed

300 tons, 4, 6 and 8-inch, class 150, Mabton, Wash., to United States Pipe & Foundry Co., Burlington, N. J., through H. G. Purcell, Seattle.
125 tons, water line, Jeromeville, O., to Central Foundry Co., Birmingham, Ala.

Cast Pipe Pending

406 tons, 24-inch, Chicago; bids Oct. 28.
140 tons, 16-inch, Seattle; bids in.
131 tons, 2 to 4-inch, Torrey, Utah; bids in.

Steel Pipe Pending

600 tons, foundation work for Homestead, Pa., 100-inch semicontinuous shear plate mill for Carnegie-Illinois Steel Corp., Pittsburgh.

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Strip Steel

Strip Prices, Page 71

Pittsburgh—Improvement in demand for stainless and cold-rolled strip steel is still a market feature and specifications are running about 35 to 40 per cent ahead of the first three weeks of September. The result has been that mill operations on cold-rolled strip steel have advanced ten points to better than 50 per cent. Hot-rolled strip steel, owing to specifications for rim and frame stock, as well as stamping stock for the general list of automotive and miscellaneous parts, is also improving and mill operations are up five points to 45 per cent. More use of stainless strip steel in 1936 automobile models will be a feature. The market on hot-rolled strip steel holds unchanged at 1.85c, base, Pittsburgh, and the cold-rolled market, 2.60c, Cleveland or Pittsburgh.

Cleveland—Strip mill operations here at 75 per cent are sustained mainly by specifications from automobile manufacturers. Miscellaneous requirements are fair, including orders from toy manufacturers who are becoming active for Christmas. Hardware manufacturers' demands are light. Producers expected heavier releases from the automobile industry in November.

Chicago—Strip specifications are in fairly steady volume, though demand is slightly less than 30 to 60 days ago. Some growth is noted in automotive releases, with further gains expected during the first half of November. Orders usually are for relatively early needs and producers' backlogs are only moderate.

Boston—Cold-rolled strip buying is heavier, consumer demand being well spread, some purchasing for more advanced delivery, Dec. 1 in some instances. Mills have larger backlogs and more sustained runs, several producers operating 70-75 per cent of capacity. Prices are steady at 2.80c, Worcester.

New York—The strip market appears most active this year, with automotive accessory manufacturers taking the principal tonnage and novelty manufacturers consuming much for the holiday trade. No lessening of demand is expected for several weeks. Prices are steady.

Philadelphia—Radio manufacturers continue to contribute principally to strip activity here. The market as a whole is far from active, but the improvement of the past several weeks in specifications appears to be sustained. Hot strip is unchanged at 1.85c, Pittsburgh, or 2.16c, Philadelphia, and cold strip at 2.60c, or 2.91c.

Shapes

Structural Shape Prices, Page 70

New York—Bids are in on 550 tons for the Manhattan approach, Triboro bridge, also 8500 tons for school and college buildings. Pending requirements are much heavier than awards, with indications of much tonnage to go to mills and fabricating shops during the remainder of this quarter.

Pittsburgh—Pennsylvania's $11,483,000 grade crossing elimination program approval is being withheld by the bureau of public roads, Washington. The latter states that this is because additional technical data have not been forthcoming from the state. American Bridge Co., Pittsburgh, has formally announced receipt of a 12,000-ton contract for the building to house Carnegie-Illinois Steel Corp.'s semicontinuous 100-inch plate mill, Homestead, Pa. Erection is expected to start about Jan. 15 and to be completed May 30, 1936. Plain structural shapes hold at 1.80c, Pittsburgh.

Cleveland—Structural demand in this district is giving little support to steel production. Fabricators estimate that about 1000 tons are pending in numerous small jobs, including industrial plant expansions and remodeling. Several hundred tons are expected to be awarded on bids opened late last week for buildings at Cleveland's easterly sewage disposal plant. Though still in a tentative stage, fabricators are hopeful of obtaining 1800 tons of sheet piling for government harbor work at Erie, Pa., this fall. At Buffalo Oct. 18 they submitted bids on 3000 tons of shapes for a federal building.

Chicago—Structural awards the past week reached the lowest level for the year to date, while new inquiries also are few and generally involve only small lots. Bridge work accounts for most of the larger inquiries. Activity in private construction is confined to projects involving less than 100 tons.

Boston—Structural awards approximate 1000 tons, including a boiler plant addition, Lynn, Mass., and a 350-ton bridge, Boston. Small lot lettings are up slightly. Inquiry is heavier with several PWA projects active, including bridges and a Providence, R. I. school, the latter taking close to 1000 tons on which bids closed last week.

Philadelphia—Releases against old contracts are sustaining operations at eastern shape mills. However, there is relatively little new construction up in this district. Local fabricators are figuring on approximately 1000 tons for shops at the Charleston, S. C., navy yard, and expect inquiry shortly for a junior high school at Scranton, Pa., requiring 800 to 1000 tons. Shape prices are steady.

DuPont interests, Wilmington, Del., have a $3,000,000 construction program under contemplation. Approximately 800 tons of shapes for a color plant at Deepwater, N. J., will be up for bids this fall. A Philadelphia interest is offering 400 tons of second-hand beams at $23, f.o.b. Philadelphia.

Buffalo—The outlook is improving steadily. Small lots are coming forward freely, especially for bridge

Shape Awards Compared

	Tons
Week ended Oct. 19	16,100
Week ended Oct. 12	26,170
Week ended Oct. 5	18,755
This week, 1934	14,973
Weekly average, 1934	16,284
Weekly average, 1935	16,172
Weekly average, September	16,725
Total to date, 1934	716,079
Total to date, 1935	695,425

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Steel Sales Corp.
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H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

construction. Larger lots are nearing contract stage and the final quarter is expected to see more tonnage placed on fabricators' books than any similar period in a year and a half.

San Francisco—Structural awards aggregated less than 500 tons, bringing the total for the year to 105,650 tons, compared with 106,007 tons for the corresponding period in 1934. Consolidated Steel Corp. obtained 250 tons for tunnel ribs for the metropolitan water district, Los Angeles, and 100 tons for a shop building for the high school at Venice, Calif.

Seattle—New projects are developing slowly but there is a fair number of jobs for prompt action. Pending tonnages approximate 2000 tons in the Pacific Northwest. Local fabricating shops report a dearth of large contracts but small jobs calling for an average of 25 tons each are increasing. Joplin & Eldon, Portland, Oreg., are low bidders at $87,415 for the Eagle Creek bridge superstructure, near Bonneville, requiring 551 tons.

Shape Contracts Placed

12,000 tons, mill building, West Homestead, Pa., to house the new 100-inch semicontinuous sheet plate mill, Carnegie-Illinois Steel Corp., to American Bridge Co., Pittsburgh. Project also includes 400 tons of reinforcing materials, 47,000 cubic yards of foundation concrete, and 600 tons of pipe and fittings.

650 tons, postal stations W and O, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

480 tons, state highway bridge, Ft. Dodge, Iowa, to Wisconsin Bridge & Iron Co., Milwaukee.

360 tons, building extension, Hoboken, N. J., for A. H. Davis Co., to Ingalls Iron Works Co., Verona, Pa.

350 tons, state highway bridge, Wellman, Iowa, to Clinton Bridge Works Co., Clinton, Iowa.

340 tons, transmission tower, Sheffield, Ala., for Tennessee Valley authority, to American Bridge Co., Pittsburgh.

325 tons, 30 beam spans, Missouri Pacific railroad, delivery various locations on line, to Stupp Bros. Bridge & Iron Co., St. Louis.

300 tons, storage building, Pontiac, Mich., for Pontiac Motor Car Co., to Whitehead & Kales Co., Detroit.

250 tons, tunnel ribs, metropolitan water district, Los Angeles, to Consolidated Steel Corp., Los Angeles.

220 tons, addition, boiler plant, Lynn Gas & Electric Co., Lynn, Mass., to New England Structural Co., Everett, Mass.; Stone & Webster Inc., engineers and contractors.

185 tons, state bridge, Kane, Pa., in McKean county, awarded through the Graham Construction Co., Lancester, Pa., general contractor, to McClintic-Marshall Co., Bethlehem, Pa.

125 tons, Lowe theater, Oak Park, Ill., to Mississippi Valley Structural Steel Co., Chicago.

110 tons, rack building No. 3, Hiram Walker distillery, Peoria, Ill., to Mississippi Valley Structural Steel Co.

105 tons, Central Congregational church, Jamaica Plain, Boston, to A. O. Wilson Structural Co., Boston; Chester S. Patten, Melrose, Mass., general contractor.

100 tons, building for Triplex Screw Co., Cleveland, to Republic Structural Iron Works, Cleveland.

100 tons, highway bridge, Millville, Mass., to Boston Bridge Works Inc., Cambridge, Mass.; through National Engineering & Contracting Co.

100 tons, shop building for high school, Venice, Calif., to Consolidated Steel Corp., Los Angeles.

Shape Contracts Pending

5000 tons, science buildings, Brooklyn college, Brooklyn, N. Y.; general contract to T. J. Waters Co., New York.

4600 tons, west side highway, Seventy-sixth to Seventy-ninth streets, New York; bids Oct. 29.

3500 tons, Franklin K. Lane high school, Brooklyn, N. Y.; Wilaka Construction Co., New York, low on general contract.

2600 tons, track work, New York Central railroad, New York; bids Oct. 29.

1275 tons, bridge, Sheffield, Ala.

1000 tons, shops, navy yard, Charleston, S. C.; bids asked.

740 tons, state bridges, Indiana; bids Oct. 22.

600 tons, state bridges, Nebraska.

550 tons, Eagle creek state bridge, Oregon; Joplin & Eldon, Portland, Oreg., low.

500 tons, Marias river state bridge, Montana; Portland Bridge Co., Portland.

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440 tons, steel truss bridge, Hayfield and Woodcock townships, Crawford county, Pennsylvania; bids to state highway department Nov. 1; included 59 tons of plain steel bars.

400 tons, Bonneville, Oreg., dam superstructure powerhouse; General Construction Co., Seattle, and J. F. Shea, Portland, low.

400 to 500 tons, bakery warehouse and carton plant, 110 x 659 feet, at Dayton, O., for Loose-Wiles Biscuit Co., Long Island City, N. Y.

360 tons, two municipal bridges, Colorado Springs, Colo.

350 tons, flooring and repairs to state bridge in Lewisburg borough, Pennsylvania; new bids to be asked, those opened on Oct. 11 rejected.

300 tons, high school, Troy, N. Y.

281 tons, Bijou creek bridge, Morgan county, Colorado; bids Oct. 21.

250 tons, Smith Cafeteria, Toledo, O.; bids Oct. 26; Mills, Rhines, Bellman & Nordhoff, Toledo, architects.

250 tons, municipal pier shed, Baltimore; C. W. Schmidt, that city, low on general contract.

233 tons, reconstruction of existing steel bridge, Harmony township, Beaver county, Pennsylvania; bids to state highway department, Nov. 1.

215 tons, also 35 tons of bars, truss steel bridge, Wyoming county, Pennsylvania, general contract to Holmes Construction Co., Wooster, O.; through Pennsylvania state highway department.

150 tons, New York state school, Wassaic, N. Y.

Reinforcing

Reinforcing Bar Prices, Page 74

New York—Pending reinforcing steel tonnage continues heavy, contracts placed lagging. While close to 1000 tons of highway mesh is active, the bulk of pending volume has been placed, with new inquiry off.

Pittsburgh — An unstated, but large tonnage of reinforcing steel may develop shortly for nearly 20 grade crossing eliminations at McKeesport, Pa. Last week this project, planned for some time, was discussed at Harrisburg, Pa., by officials of McKeesport, and by those of the Baltimore & Ohio and Pittsburgh & Lake Erie, in conference with the state highway superintendent. Costs estimates are to be prepared. About 200 tons of reinforcing materials are involved in construction of the Carnegie-Illinois Steel Corp., Homestead, Pa., plate mill. The market on reinforcing steel bars holds at 1.85c, mill, or 2.05c as quoted by distributors for cut lengths. Rail steel bars are quoted 1.95c by distributors.

Cleveland—Some fairly substantial tonnages are pending, including 2200 tons for two federal housing projects here, for which general contracts have been awarded. Lundoff-Bicknell Co., Cleveland, is reported low on unit bids opened Oct. 17 for contract No. 88 at Cleveland's easterly sewage disposal plant, requiring 380 tons of bars, 300 tons of shapes and 100 tons of miscellaneous steel items. Some small lots have been awarded by FERA.

Chicago — Concrete bar awards are headed by 1800 tons for another section of the Milwaukee filtration plant. About 1100 tons are pending for various sections of the Chicago sanitary district program, while a fairly large tonnage will be required soon for Illinois state highway work including road building, bridges and grade separations. Inquiries have

Concrete Awards Compared

	Tons
Week ended Oct. 19	10,246
Week ended Oct. 12	11,675
Week ended Oct. 5	2,550
This week, 1934	3,531
Weekly average, 1934	4,084
Weekly average, 1935	6,788
Weekly average, September	28,497
Total to date, 1934	197,804
Total to date, 1935	291,922

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yet to appear for most of the latter projects. Fair activity continues in private work involving individual lots of less than 100 tons. Distributors' prices of reinforcing bars are fairly steady.

Boston—Reinforcing steel buying is slightly more active with new inquiry heavier. Led by 450 tons for a sewage treatment plant in Connecticut, volume placed approximates 700 tons.

Philadelphia—C. W. Good, Lancaster, Pa., is expected to be awarded shortly the general contract for the construction of further reservoir work at Reading, Pa., requiring approximately 1150 tons of reinforcing bars. No bar awards of consequence have been noted here over the past week. Billet steel bar prices are somewhat firmer, although still irregular.

Seattle—Demand has improved somewhat, especially in Oregon and Montana where a number of concrete bridges and overpasses have been awarded, total amount being estimated at approximately 1000 tons. In Washington volume is not heavy, but with public construction assuming definite form requirements will be larger in the near future. The largest award pending totals 3500 tons for the Bonneville, Oreg., powerhouse and fishways, General Construction Co., Seattle, and J. F. Shea, Portland, Oreg., low bidders at $1,160,307.

San Francisco—The majority of awards on the Pacific coast were limited to lots of less than 100 tons. More than 40 grade separations in California requiring several thousand tons of reinforcing and structural steel are scheduled to come up for figures soon. Bids have been opened on 1050 tons for barracks at the air fleet base, Pearl Harbor, T. H.

Reinforcing Steel Awards

6000 tons, Randals Island junction of Triboro bridge, New York, to Rawlins Steel Co., New York.

1800 tons, Milwaukee filtration plant, to Concrete Steel Co., Chicago.

750 tons, grade eliminations, Tompkinsville and Stapleton, Staten Island, N. Y., to Igoe Bros., Newark, N. J.

611 tons, bid 45601, metropolitan water district, Los Angeles, to Concrete Engineering Co., Los Angeles.

560 tons, barracks, naval station, Pensacola, Fla., to Virginia Steel Co., Richmond, Va.; Virginia Engineering Co. Inc., Newport News, Va., general contractor.

250 tons, highway, Elizabeth and Roselle Park, N. J., to Igoe Bros., Newark, N. J.

150 tons, for FERA, Cleveland, to Patterson-Leitch Co., Cleveland.

125 tons, sewer reconstruction, Triboro bridge, New York, to National Bridge division, Jones & Laughlin Steel Corp., Pittsburgh.

Reinforcing Steel Pending

3500 tons, Bonneville, Oreg., powerhouse and fishways; General Construction Co., Seattle, and J. F. Shea, Portland, low.

1150 tons, reservoir work, Reading, Pa.; C. W. Good, Lancaster, Pa., low on general contract.

1100 tons, San Pablo avenue undercrossing, Oakland, Calif.; J. F. Knapp Co., low on general contract.

1100 tons, west side federal housing project, Cleveland; Madsen Construction Co., Minneapolis, general contractor.

1100 tons, Outhwaite federal housing project Cleveland; George A. Fuller Co., Washington, general contract.

400 tons, foundation work for Homestead, Pa., 100-inch semicontinuous shear plate mill of Carnegie-Illinois Steel Corp., Pittsburgh.

380 tons, also 300 tons of shapes and 100 tons of miscellaneous steel items, contract No. 88, Cleveland's easterly sewage disposal plant; Lundoff-Bicknell Co., Cleveland, reported low on unit bids for general contract, Oct. 17.

194 tons, state crossing, Orange county, California; bids Oct. 31.

127 tons, paving work and reconstruction of bridge, Harmony township, Beaver county Pennsylvania; bids to state highway department, Nov. 1.

Cutler-Hammer Inc., Milwaukee, has received a government order aggregating $126,686 for electrical controls and switching equipment for station auxiliaries and lighting for the power plant part of the Boulder

Behind the Scenes with STEEL

Yen for Kinzoku

A FLASH from Okamoto near Kobe, Japan, informs us that "the annual special number of *Kinzoku*, the journal of metals, all written in English, will be issued in January, 1936, by the Agne Institute of Technology in order to introducing the development of the metal industries in our country, as already you may know that we published monthly the *Kinzoku* with abstracts and synopsis in English, to promote the science and practice of metals and alloys to all the industrialists."

For one solitary yen per copy you can have the following: *R. Maeda: "Kawaguchi—A Unique Locality of Iron Foundry in Japan"; J. A. Rabbit: "Japan's Advance in Applies Metallurgy"; K. Takahashi: "Nonferrous Metals and Allous in Japan"; and S. Okamura, E. Itami, K. Tawara, D. Saito and K. Honda—"Undecided."*

Editor C. H. Tonamy says "we shall feel much grateful if you will kindly help my work by inserting beforehand this our issue on your publication and introducing me the readers in your country."

O.K., C. H. Readers. Attention! Meet the Hon. C. H. Tonamy of Okamoto near Kobe. Hon. Tonamy, our readers.

* * *

A la McIntyre

DIARY of a modern dyspeptic: Up betimes and toddled off to my cubby hole in the seething city, where did scan 15 new subscriptions to my bread and butter. Whoops! To noontime repast with editor who unfolded plans for many wupsie articles in issues to come. At twilight strolled along Cuyahoga river bank, meditating upon Franklin D. Roosevelt's smile. To bed with double dose of sleeping powder.

* * *

Here Today, etc.

HAVE you been keeping tab on the rapid-fire personnel changes of recent weeks in ranks of some of the major steel producers? They have been shifting about so frequently and so suddenly that our "personals" editor puts his pages to bed on Friday with a scared look and fingers crossed on both hands, hoping that by Monday morning Q. Q. Jones who just resigned as president of the Worldwide Steel Co. to become Asst. V. P. of Seacoast Steel will not have been promoted to V. P. and T., succeeding Z. Z. Smith who will have resigned to open an antique shop. Anyway, it will pay you to keep posted to avoid insulting your friend by calling him a vice president when he actually is third assistant executive vice president.

* * *

Photo

WE INSTINCTIVELY ducked after first glance at that speedboat zooming out of the water on page 4 of the Oct. 14 issue. One of the better illustrations.

* * *

Lino Slip

AN ALERT reader calls attention to one of those baleful typographical errors in STEEL for Oct. 14, in which reference is made to the "Untied States." Taking some aspects of the current situation into consideration,

this may not be so far off, at that. Maybe one of our linotype men is an anti-new dealer. Remind us to ask Mr. H. C. Williams who is in charge of the Penton Press composition department. He should know.

* * *

Mars Incarnate

SOMETHING should be said in this department, we suppose, about war, just to prove that we keep abreast of the news. Well, it may be war to some, but to this observer so far it looks like a war solely between opposing propagandists. According to our count, Italian press headquarters are one up on the Ethiopian censors, but the evening papers may change that.

When this country becomes involved in any foreign embroglio (is that the word?), we will be comfortably ensconced in a small but livable cave in the Tennessee hills, reverting to type, barbecuing rabbits over a fire, wrapped in bearskins and gazing disconsolately at the rusted ruins of a 1933 Plymouth. Let 'em come and get us!

—SHRDLU

Wire

Wire Prices, Page 71

Pittsburgh—Buyers of manufacturing wire products are still entering frequent and sizable specifications, but the dropping off expected in merchant wire items in view of the expiring farm buying season had generally been expected. Little practical test has been given to the revised method of quoting merchant wire products, which incorporates reductions for quantity, and more significant test probably will not develop much before late November. Pittsburgh base on plain manufacturing wire remains quoted 2.30c and spring wire, 2.90c, with nails, $2.40 per keg, staples, 3.10c, and woven wire fencing, $58.

Cleveland — Demand for manufacturers' wire shows further gains, mainly in automobile requirements. Jobbers are reporting better distribution. Spring terms have been announced on farm material, and this generally is followed by increased buying. The discounts on 500 rods of farm fencing or on 500 steel fence posts range from 4 per cent if paid on or before Nov. 10, down to net if payment is deferred until April 30. With the farm market generally in a strong position substantial orders are expected to develop shortly.

Chicago—Further gains in wire buying indicate October will exceed September's good activity. Diversification in demand still is characteristic of the manufacturers' wire market, with automotive releases improving slowly but steadily. Specifications from jobbers are slightly heavier but still leave something to be desired.

Boston—Demand for wire continues heavy. While specialties and manufacturers wire lead, there is a broader miscellaneous demand with spring wire more active, due in part to better releases traceable to the automotive trade. Additional gains have been made by producers of cable, although heavier goods continue to lag.

Semifinished

Semifinished Prices, Page 71

Contrary to the market just prior to the World War, there have been no inquiries for semifinished steel from any foreign nations reported in American markets. Meanwhile, sheet bar, slab, and skelp business for domestic accounts holds at a steady rate, contrasted to slower conditions in the wire rod and billet markets. Pittsburgh price on sheet bars is $28; rerolling billets, $27; forging quality billets, $35; and common wire rods, $38.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Tin plate producers continue to operate at about 50 per cent of aggregate capacity. The leading interest last week was able to schedule operations at 60 per cent, but like other producers, has no assurance of schedules a week in advance. Heavy stocks of finished plate continue to be held and, according to all indications, will carry over to a large extent into 1936. Something approaching 4,000,000 base boxes, or 200,000 tons of finished tin plate are in the hands of mills awaiting shipping directions. However, prospects in such canned goods as California fruits, salmon, and beer are encouraging. The market holds at $5.25 per base box, Pittsburgh.

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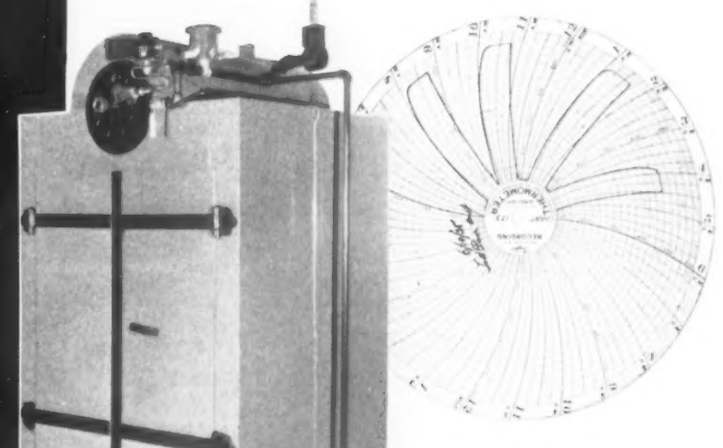

Heating time and precise temperature control are shown in the above chart. As little as ten minutes is required to heat the charge. Temperature uniformity can be held within 1 degree F. variation.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Carnegie-Illinois Steel Corp. estimates that 15,000 tons of castings and forgings will be required for the construction of the new 100-inch semicontinuous plate mill at Homestead, Pa., design of which is now about 60 per cent completed. A large part of the 15,000-ton requirement will be in castings for the rolling mill. Current merchant pig iron market is still devoid of interest and only small lots are moving. Pig iron producers still hold to the unchanged market of $18.50 for foundry grades, base, Pittsburgh district furnace, $18 for basic, and $19 on bessemer, in spite of the firmer tendency of coke prices.

Cleveland—Shipments continue to increase their lead over the September and early October averages, with automobile foundries and manufacturers of heating equipment and machinery accounting for a substantial share of the tonnage. New buying is restricted mainly to small fill-in orders, as a majority of melters have covered the third quarter requirements. Prices are strong.

Chicago—Pig iron shipments so far this month are 25 to 30 per cent heavier than during the corresponding September period. This gain results almost entirely from the upturn in foundry schedules, since speculative purchases last month will not be fully reflected in deliveries until later this quarter. Gains in foundry operations are fairly general, with automotive and farm implement plants experiencing the best rates. The anticipated advance in pig iron prices has yet to materialize, the market continuing $18.50, furnace, for No. 2 foundry and malleable.

Boston—Small-lot sales of pig iron for prompt delivery are numerous. Several inquiries for moderate needs, including 500 tons of No. 1X for a textile machinery consumer, are also being closed. Foundry melt is gradually improving with machine tool shops the most active. Prices for domestic brands are steady and unchanged.

New York—While new orders are off, as was expected in view of recent contracting, shipments of pig iron are heavier. This movement is unquestionably the largest in many months. Barge shipments are being stimulated as the end of the season approaches. Shippers are being advised to get cargoes under way not later than Nov. 30.

Philadelphia—New pig iron buying is spotty, although some sizable orders are reported and shipments so far this month continue to expand. One seller reports two orders involving 400 and 500 tons each. Prices are strong, but no changes are expected to become effective before the first of next year.

Buffalo—Consumption of pig iron in this area is expected to turn upward sharply about the end of the year at which time a reconstructed Pierce plant of the American Radiator Co. will go into production, according to reports. Two large melting furnaces are being constructed at the plant, which has been idle for many months. The market for iron shows the natural reaction following heavy covering for the quarter, but shipments are steady.

Cincinnati—Shipments of pig iron are sharply improved, assuring an October tonnage much heavier than in September. This demand is shown both in specifications against contracts and in spot buying. The melt in machine tool foundries remains heavy, with the trend upward in stove and automobile production.

St. Louis—A majority of pig iron sellers report a further recession in new sales, but shipments maintain high levels of recent weeks. Requirements through the present quarter

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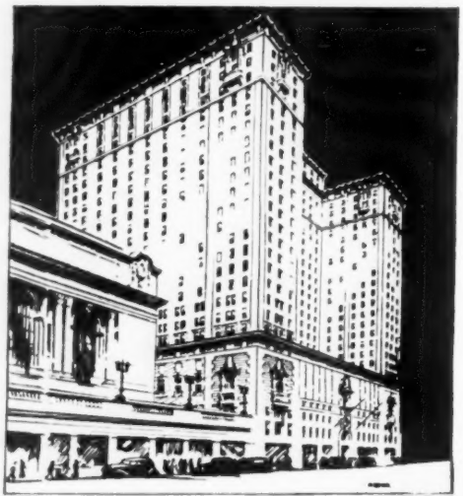

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are fairly well covered, and some speculative purchasing into the first quarter of 1936 is reported, both by distributors of southern and northern iron.

Birmingham, Ala.—Market continues firm with some consumers reporting attractive new business in sight. These interests, however, plan no change in their buying iron, in small lots and more frequently. Base price remains firm, $14.50, No. 2 foundry. Seven blast furnaces are in operation, five on foundry and two on basic.

Toronto, Ont.—Merchant pig iron sales are increasing at a steady rate and melters are taking larger tonnages of iron for spot delivery. With the federal election out of the way it is expected that further business expansion will be noticeable in the immediate future. Pig iron production continues at its peak level with four stacks blowing.

Scrap

Scrap Prices, Page 73

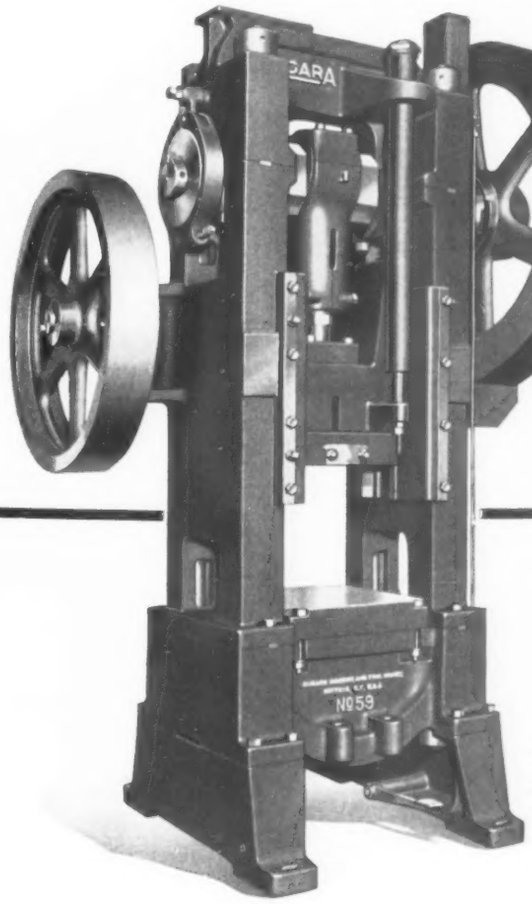
Pittsburgh—The market continues dull but prices are held, due to the large broker short interest. The presence of consumers' scrap buying was noticeably lacking last week, except in the case of one mill, which bought about 4000 tons of scrap rails and was able to reduce its buying price to $14.50, causing a 25-cent per ton decline in this market. Brokers are offering from $13.25 to $13.50 for coverage against No. 1 heavy melting steel orders, $9.75 on machine shop turnings and around $15.50 on railroad specialty items.

Cleveland—Dullness marks the steel and iron scrap market with holders of scrap awaiting expected higher prices. Railroads have refused bid prices and have sold little. No buying is expected for a fortnight. Prices here and in the valley are unchanged.

Chicago—Scrap prices continue steady. Mill buying has been bolstered by large purchases of heavy melting steel by a leading interest, estimated to have involved at least 60,000 tons, at $12.75. Scrap has been entering the district rather freely, some material formerly moving eastward having been diverted here by the relatively favorable levels of price and consumption. A quieter situation in mill purchases is anticipated for the next several weeks.

Boston—Buying for export is less active, although scrap demand by domestic consumers has improved slightly. Prices, however, are inclined to ease slightly on the more active grades. A fair volume has been done on No. 1 machinery cast to New England consumers during the last 10 days at $9 to $9.50, delivered.

Philadelphia—While no change is noted in steel scrap, heavy breakable cast and No. 1 cupola cast have advanced, and a still further increase is noted again this week in railroad malleable. Attracted by the advancing market resulting from demand from outside the district, consumers of railroad malleable in eastern Pennsylvania are buying more freely, with the result that prices on this grade are strong. At present railroad malleable is holding at $13.50 to $14, delivered, eastern Pennsylvania consuming point, an advance of about $1.50 a ton within the past fortnight. Railroad malleable here has been moving west as far as Cleveland, an unusual condition. The leading eastern Pennsylvania consumer of steel scrap has recently bought about 2000 tons of No. 1 steel for Steelton, Pa., where a unit has recently gone into operation, at $11.50 to $12, delivered, depending on origin of material. This same interest has been paying $11 to $11.75 for some scattered lots of No. 1



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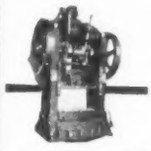

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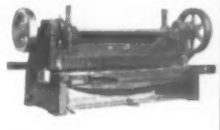

PRESSES **NIAGARA** SHEARS

steel for Bethlehem, Pa. His offering prices for Sparrows Point, Md., remain the same as for the past several weeks.

Buffalo—The deadlock in scrap continues. Mills are buying all possible material for delivery by water but dealers say receipts are now far below melt and that the largest tonnage purchases in many months are close at hand. Turnings and borings are being shipped out of the district on higher bids than are available here. Malleable has brought close to $15 at Buffalo, higher prices nearby.

The Lackawanna consumer is taking heavy quantities of steel scrap, both by rail and barge, in expectation of the seasonal suspension of operations on the New York State barge canal around the end of November. The company is paying up to and including $12, delivered, for scrap moved by rail and $11.50, delivered alongside dock at Lackawanna, for barge shipments, the 50 cent differential in this latter case providing for unloading charges.

Detroit—Reductions of 25 to 50 cents in blast furnace scrap, new No. 1 busheling, No. 2 steel, machine shop turnings and hydraulic compressed sheet scrap have confirmed a noticeably weaker market in this district. This is in part explainable by heavy shipments to Cleveland, Buffalo, and Valley points before the close of the lake transportation season.

Cincinnati—Sales of moderate tonnages of iron and steel scrap to Valley consumers have failed to disturb prices. Mills refuse to buy tonnages at present quotations and are fortified with material for varying periods.

St. Louis—In absence of quantity purchasing iron and steel scrap has drifted into a period of quiet. Mills are fairly well covered for immediate requirements and despite continued talk of higher prices are not disposed to augment their holdings. Cast scrap continues scarce and firm. Jobbing foundries report freer specifications on automotive castings.

Birmingham, Ala.—A firm market is reported, with prices unchanged and continued buying in small tonnages. One of the larger consumers of heavy melting steel has been buying old rail for some time and purchasing direct.

Seattle—Prices of steel and iron scrap are steady in the absence of export business, which indicates to shippers that foreign buyers are about to renew interest. Exporters are actively seeking desirable tonnages but supplies are not heavy in the interior. Local consumption is confined to small lots as melters are not buying in volume.

Toronto, Ont.—Iron and steel scrap prices are holding at the recently revised level and demand gradually is improving. Local dealers state they have good contracts for steel scrap for delivery to the Hamilton district and there is a steady movement of heavy melting steel on this account. Turnings also are showing improvement, while other steel lines are beginning to attract attention. Foundries are in the market at regular intervals for scrap.

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Warehouse

Warehouse Prices, Page 74

New York—Warehouse sales hold to the current rate, and indications are this month's total will at least equal September, with several of the larger consumers running ahead. The extra formerly charged for forging quality on round bars has been eliminated, resulting in some reduction in the base price of this quality.

Cleveland—Further moderate improvement is noted in warehouse orders and tonnage, with business well distributed for various products. Prices are steady.

Chicago—Sales show little change from the September rate and October appears likely to be one of the three best months of the year. Demand continues well diversified, with inquiries moderately active. Prices are unchanged.

Philadelphia—Warehouse business here is being well sustained, with prospects that the month as a whole will show an increase over September. Prices are unchanged.

Baltimore—Two jobbers here—William A. Conway and the Seaboard Steel & Iron Corp.—have divided 320 tons of No. 22 gage hot-rolled pickled sheets for license tags for Maryland. General warehouse activity here continues to improve, with some resellers expecting October to be one of the best months this year.

Detroit—Steel shipments continue at a high level, but the end of many plant rehabilitation programs is in sight and consequently warehouse business should undergo some early decline. All jobbing steel prices are unchanged.

Cincinnati—Sales from warehouse show improvement over last month, especially on more frequent ordering by industrial users of shapes and bars. Despite earlier inquiries, building materials remain dull.

St. Louis—October business to date is ahead of the like period last month, and, also a year ago. The general manufacturing trade continues to expand, with notably heavier purchasing by furniture and tool makers. Bars and flats are now quoted at 3.25c, up $1 per ton, and steel bars of other sections at 3.40c.

Seattle—Business is holding up well, light plates continuing in best demand. Repair and overhauling jobs are numerous, while inquiries from Alaska have been heavy. Volume is confined to small lots, and there is only occasional mill business. Prices are steady.

Chandler Boyd Supply Co., Pittsburgh, has been appointed distributor of sheet metal products for the American Sheet & Tin Plate Co., Pittsburgh.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

The bolt and nut industry is operating at 45 to 50 per cent at Cleveland. Automobile specifications are steady, but have not shown further improvement. In some quarters it is believed automobile manufacturers will try to get new models into the hands of all dealers as rapidly as possible and then adjust production schedules as the market develops. Agricultural implement demand on bolt and nut makers is not as brisk as previously this year, and little is coming from railroads. Jobbers' requirements are fairly strong.

Demand at Chicago shows moderate improvement, jobbers buying more liberally, agricultural implement makers taking heavy requirements but railroads buying little.

Prices are steady at 75 off list for nuts and bolts, 2.90c, Pittsburgh and Cleveland and 3.00c, Chicago, for structural rivets and 70 and 5 off for small rivets.

Fluorspar

Fluorspar Prices, Page 72

Cleveland—Domestic and imported fluorspar prices have been advanced $1 a ton for immediate effect. To some extent this is a reaction due to the Italo-Ethiopian war.

American steelmakers import considerable material from Spain and Italy. Ocean freight rates have increased sharply. At the same time, steelmakers apparently have been more anxious to lay in stocks, making heavy demands on domestic producers.

Imported washed gravel fluorspar has been raised from $18.75-$19 to $20, per net ton, duty paid, tidewater. The domestic 85-5 per cent, washed gravel now is $15.50, a net ton in carloads, f.o.b. Kentucky and Illinois mines for all-rail shipment, and $16.50 a ton f.o.b. Kentucky and Illinois river landings for Ohio river barge movement. No. 2 lump fluorspar for all-rail delivery is nominally $16.50. Prices of domestic fluorspar were raised $1 a ton in July.

Metallurgical Coke

Coke Prices, Page 71

Sellers of standard furnace coke are quoting $3.75 a ton minimum on new inquiries and $3.50 a ton for medium sulphur grade, both on a Connellsville, Pa., oven, base. However, in standard furnace coke many buyers negotiated their requirements at about $3.50 and are specifying against these contracts. A firmer tendency is noted in Connellsville beehive foundry coke and the range is now $4.35 to $4.50, as against $4.30 minimum previously. Beehive premium foundry coke has undergone another advance and is now quoted $5.50 to $5.75. Beehive coke sellers are advancing the price on egg and nut domestic coke to $3.95 in the Buffalo district Oct. 21.

Foundry coke shipments at Chicago in October are about 10 per cent above the September rate in spite of the heavy September deliveries to forestall the price increase. Producers at Cincinnati find themselves pressed to meet delivery demands for by-product foundry coke and shipments are heavier. The advanced price of $9.50, delivered, is steady. Shipments are heavier in the St. Louis district, reflecting the larger melt and tendency to accumulate stocks. Birmingham, Ala., cokemakers are holding the rate of output in spite of a miners' strike.

Ferroalloys

Ferroalloy Prices, Page 72

New York—Ferromanganese shipments are expanding, with most consumers under contract at $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is steady at $26, Palmerton, Pa., on lots up to 50 tons; and $24 on 50 tons and over. Imported fluorspar, 85-5, has been increased to $20, duty paid, tidewater, per net ton, from $18.75 to $19. Stronger market abroad, combined with improved demand here, is responsible. The movement of fluorspar here is expected to expand up until the time cold weather sets in.

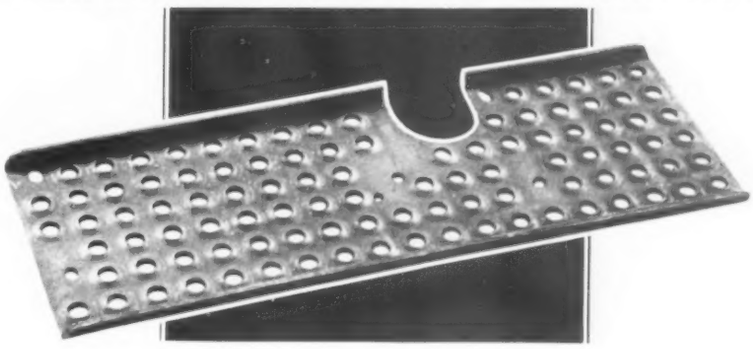
Steel in Europe

Foreign Steel Prices, Page 74

London—(*By Radio*)—September brought the steel and iron industry of Great Britain an increased daily rate of production in both pig iron and steel ingots. With 97 blast furnace stacks active at the end of September, compared with 98 at the end of August, total output in September was 529,600 gross tons, a daily rate of 17,653 gross tons, compared with 543,400 tons and a daily rate of 17,529 tons in August. Total production of steel ingots and castings in September was 855,900 gross tons, a daily rate of 34,236 tons, compared with 759,900 tons in August, a daily rate of 28,144 tons.

Imports of steel and iron products in September were 89,309 gross tons, in August 74,300 tons, a gain of 15,-

RAILROAD SAFETY via STAMPINGS



RAILROADS, as with industry in general, are looking-up to the steel stamping as a combined economic and effective method of application to their equipment or product. This freight car step—a stamping by Parish—additionally serves a major safety factor by imparting a sharp, self-cleaning tread impervious to ice, snow, grease and wet shoe soles.

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609 tons. Exports in September were 187,153 tons, in August 202,500, a loss of 15,347 tons.

Producers of pig iron in Great Britain are heavily booked until the end of the year. The steel trade is active in almost all departments and Scottish works are busier with shipbuilding orders. Inquiries for export steel are expanding, the Argentine market being most in evidence. Trade in tin plates in strong and recent improvement in galvanized sheets is being maintained.

The Continent reports export markets are livelier, except in galvanized and plain sheets, Egypt and South America inquiring most actively.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—Activity in domestic nonferrous metal markets subsided to a generally slow pace last week. Sharp fluctuations in tin prices and advances in antimony were the outstanding features.

Copper—Sales were light due to recent heavy coverage of consumers and removal of the threat that the foreign market would reach parity. Producers quoted 9.25c, Connecticut, for electrolytic, and barring unforeseen developments will hold current levels steady for some time.

Lead—Moderate business was transacted and was more evenly distributed than the previous week. The market appeared steady at 4.35c, East St. Louis, and 4.50c, New York. St. Joseph Lead continued to ask $1 premium on certain of its brands in the Eastern market.

Zinc—Only light business was done but all sellers quoted levels unchanged on the basis of 4.85c, East St. Louis, for prime western.

Tin—Prices moved sharply on wide fluctuations in London. Compared with a high of 54.00c Monday, quotations on Straits spot dropped to as low as 51.50c later in the week. The drop in London was attributed to a shipment there of 500 tons of tin from Amsterdam, to the likely alteration of export quotas Tuesday, and to the general unsettled conditions caused by war developments.

Antimony—Despite light demand prices rose sharply to 16.75c, duty paid New York, for Chinese spot.

Iron Ore

Iron Ore Prices, Page 73

Cleveland—The general advance in foreign ore prices, due primarily to higher ocean freight rates, is not likely to have an effect on Lake Superior iron ore prices immediately, as consumers are protected with contracts.

However, if the foreign ores should continue to rise, this would again open up the eastern markets which have been practically closed to lake producers for the past five years. If protracted, the Italo-Ethiopian war might contribute to an advance in lake ore prices next spring. The rise in imported fluorspar of $1 a ton has led immediately to a similar increase in Kentucky and Illinois material, as consumers have sought larger stocks, cleaning up the stocks at the mines.

Practically all imported raw materials have been affected by the war's influence on freight rates. No manganese ore is coming to this country from Russia, one of the chief sources of supply, owing to the fact freight rates through the Mediterranean sea have been raised 2000 per cent making them prohibitive. American steelmakers, long ago fearing the trend of events, stocked heavily with foreign manganese ore.

The Lake Superior Iron Ore association reports the following regarding Lake Superior ore consumption and stocks:

	Tons
Consumed in August	2,615,927
Consumed in September	2,654,278
Increase in September	38,351
Consumed in September, 1934	1,236,392
Ore on hand at furnaces Oct. 1, 1935	28,512,023
Ore on Lake Erie docks Oct. 1, 1935	4,956,828
Total Oct. 1, 1935	33,468,851
Total Oct. 1, 1934	34,880,878

Shipments of iron ore from Lake Erie ports to interior furances in September totaled 11,029,224 tons, compared with 9,694,508 tons in the month last year. Receipts and shipments from the ports and dock balances Oct. 1 follow:

	Receipts	Shipments	Dock Balance Oct. 1
Buffalo	1,477,598	1,332	2,661
Erie	829,068	852,256	79,451
Conneaut	2,839,600	2,754,540	1,790,806
Ashtabula	1,916,801	1,654,963	1,548,921
Fairport	634,608	640,233	387,085
Cleveland	4,196,789	3,159,386	712,129
Lorain	1,821,800	989,071	12,527
Huron	588,999	498,563	410,055
Toledo	950,488	478,880	13,193
Total	15,255,751	11,029,224	4,956,828
Comparative 1 yr. ago	13,382,639	9,694,508	5,200,825

Receipts for the season at other lake ports:

	Tons
Detroit	761,960
Indiana Harbor	1,207,757
Gary	1,446,855
South Chicago	2,287,552
Sault Ste. Marie, Ont.	191,954
Hamilton, Ont.	229,041
Total	6,125,119
Comparative 1 year ago	5,095,444

Total receipts lower lake ports 21,380,870

Quicksilver

New York—Following active sales, quicksilver prices are firmer, but nominal in absence of supplies. Sellers generally are out of the market or caring for regular customers only from the small stocks on hand. Small lots are nominally quoted $73, a flask, with no round lots of 100 flasks obtainable.

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OFFICES
CLEVELAND CHICAGO PHILADELPHIA

Activities of Steel Users and Makers

HEINE BOILER CO., St. Louis, has completed largest steel tank it has built in its 52 years. It is for the Shell Petroleum Corp. refinery at Houston, Tex., and is a bubble tower used in the manufacture of gasoline. It is 65 feet long, 11 feet in diameter and weighs 200,000 pounds. The tower was loaded on two freight cars at the Heine plant by means of a specially-constructed derrick. There will be two carloads of pipe outlets for the tank.

Two smaller tanks are now under construction by the boiler company, one to be 40 feet long and 11 feet in diameter, and the other 20 feet long and 6½ feet in diameter. Both are part of the bubble tower equipment.

Approximately 50 men have been engaged for three months in building the tank.

♦ ♦ ♦

Reeves Pulley Co., Columbus, Ind., announces that effective as of Oct. 1 the complete line of Reeves variable speed control equipment is being distributed on the Pacific coast from the four conveniently-located branch offices of the Chain Belt Co., Milwaukee. These offices are located in Los Angeles, San Francisco, Seattle and Portland, Oreg.

♦ ♦ ♦

Hevi-Duty Electric Co., Milwaukee, has announced that the Driver-Harris Co., Harrison, N. J., and the Hoskins Mfg. Co., Detroit, have been licensed to manufacture wire-ribbon and cast grid resistors of Smith alloy No. 10.

♦ ♦ ♦

Deere & Co., Moline, Ill., has purchased the combine business of the Caterpillar Tractor Co., Peoria, Ill., and will manufacture the line at its John Deere Harvester Works plant at East Moline, Ill.

♦ ♦ ♦

Udylite Co., Detroit, has opened a warehouse in Chicago at 1934 Walnut street, to better serve its customers in that territory. It also has appointed the Donald Sales & Mfg. Co., Milwaukee, as distributor of its complete line of plating and polishing supplies in Wisconsin.

♦ ♦ ♦

Kent-Ervin Engineering Co., 732 Builders Exchange building, Minneapolis, has been appointed agent to handle the line of boiler water conditioning and control equipment manufactured by the Elgin Softener Corp., Elgin, Ill., in Minnesota, northwest Wisconsin, and North and South Dakota.

♦ ♦ ♦

Elliott Co., Jeannette, Pa., through the Winton Engine Corp., Cleveland, and the Hooven-Owen-Renschler Co., Hamilton, O., has been awarded contract for the electrical equipment for the six submarines let by the navy department to the Portsmouth, N. H., and Mare Island, Calif., navy yards, and the Electric Boat Co., Groton, Conn. The Elliott company has supplied the electrical machinery for 12 of the last 16 submarines let under the new submarine building program covering the past two years.

Stainless Steel in Sign

What is claimed to be the "first signboard in the country to have individual letters fabricated entirely of stainless steel" has been built on Pittsburgh's Boulevard of the Allies, according to Allegheny Steel Co., Brackenridge, Pa., which supplied the stainless steel. Each letter, which extends about 12 inches from the face of the 20 x 40-foot sign, has a 7-inch flange upon which are mounted five rows of colored neon light tubing.

Convention Calendar

Oct. 23-24—Institute of Scrap Iron and Steel. Semiannual meeting at Hotel Statler, Cleveland. Benjamin Schwartz, 11 West Forty-second street, New York, is director general.

Oct. 26-29—National Machine Tool Builders' association. Thirty-fourth annual convention at the Homestead, Hot Springs, Va. Herman H. Lind, 1220 Guarantee Title building, Cleveland, is general manager.

Oct. 31-Nov. 1—Packaging Machinery Manufacturers Institute—Third annual meeting at Briarcliff Manor, Westchester county, New York. Miss Helen L. Stratton, 342 Madison avenue, New York, is secretary.

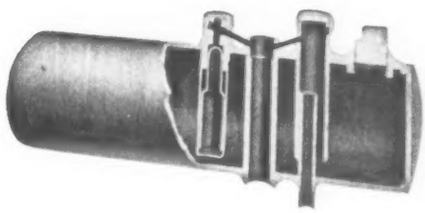
Nov. 12-15—International Acetylene association. Thirty-sixth annual convention at Hotel Cleveland, Cleveland. H. E. Reinhard, 30 East Forty-second street, New York, is secretary.

Nov. 18-20—National Foreign Trade council. Twenty-second convention in Houston, Tex. Lindsay Crawford, 26 Beaver street, New York, is secretary.

Nov. 20-21—National Founders' association. Thirty-ninth annual meeting at Waldorf-Astoria hotel, New York. J. M. Taylor, 29 South La Salle street, Chicago, is secretary.

Dec. 2-5—American Society of Mechanical Engineers. Fifty-sixth annual meeting at Engineering Societies building, New York. C. E. Davies, 29 West Thirty-ninth street, is secretary.

CROSBY STAMPINGS



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Labor

NEARLY 10,000 mill workers of Jones & Laughlin Steel Corp. at Aliquippa, Pa., have signed employe representatives' petitions making a request for a 15 per cent wage increase, following a meeting held Oct. 11. This request, similar to that announced recently by a centralized body of employe representation spokesmen for workers of the American Sheet & Tin Plate Co., is the second made by any such group.

Commenting Friday on this movement for higher wages, Ernest T. Weir, chairman, National Steel Corp., Pittsburgh, declared that a raise at this time would be detrimental. It would have to be passed on in higher prices and would not help business. Labor desires more money each week in its pay envelopes rather than more cents per hour, and this can come only through a pickup in the steel industry, he asserted.

At present, according to Mr. Weir, the industry is suffering from a general lack of confidence which he accepts as justified because of the political situation.

ALUMINUM CO. GRANTS PAY RAISE TO A. F. OF L. UNION

Aluminum Co. of America last week concluded a pact with the National council of Aluminum Workers, an American Federation of Labor affiliate, which included a 5 per cent wage increase to some 15,000 hour rate workers, effective Dec. 15. The new agreement recognizes principles of collective bargaining, sets up orderly rules for handling grievances, and provides satisfactory rules for layoffs and rehiring of employes. It appears likely that the pact will be accepted by workers in all of Aluminum company plants with the exception of Alcoa, Tenn., where a vote is to be taken soon on ratification.

FAFNIR PAYS 6% BONUS

Fafnir Bearing Co., New Britain, Conn., has paid its 1200 employes a 6 per cent bonus of their wages for the third quarter. In the first quarter the bonus was 8½ per cent, in the second quarter 5 per cent.

Financial

FIRST of the integrated producers of steel to report, Gulf States Steel Co., Birmingham, Ala., comes through with a net profit of $58,433, after charges, for the third quarter. This is distinct improvement compared with a deficit of $66,662 in the second quarter, and a loss of $205,374 in the third quarter of 1934. In 9 months of 1935 Gulf States has made $21,919; in 9 months of 1934 it lost $13,571.

CASTLE 9-MONTH NET UP

A. M. Castle & Co., Chicago, reports for the third quarter net profit of $80,629, against $87,000 in the preceding quarter and $54,786 in the corresponding 1934 period. Nine months' profit was $251,324, compared with $217,306 a year ago.

PLANS REORGANIZATION

Reorganization plan proposed by the Mackintosh-Hemphill Co., Pittsburgh, will be heard Nov. 8 in federal court in Pittsburgh before Judge R. M. Gibson. The company Oct. 11 filed a petition for reorganization because of inability to pay bond interest and meet sinking fund payments, and in the face of a threat by a protective committee to foreclose on first mortgage bonds. The company estimates its assets at $4,563,888 and its liabilities, exclusive of capital stock, at $2,077,002.

WESTINGHOUSE IN SHARP GAIN

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., made net profit of $2,557,552 in the third quarter, compared with a loss of $332,062 in the third quarter of 1934. For nine months the company's profit in 1935 was $8,822,640, while its loss in 1934 was $363,787. Orders booked in the third quarter were 21 per cent higher than a year ago, while sales billed were up 24 per cent.

TO ISSUE NEW DEBENTURES

Allis-Chalmers Mfg. Co., Milwaukee, plans to issue $15,000,000 of 10-year convertible debentures, the proceeds to be used to retire a debenture issue now outstanding. The company reports for the first eight months of this year net profit of $1,098,001. Profit for the first half was $554,955, compared with a deficit a year ago.

LUDLUM TO ISSUE COMMON

Ludlum Steel Co., Watervliet, N. Y., has filed a registration statement with the security and exchange commission seeking to issue 73,251 shares of $1 par value common stock, to be offered at the market.

NATIONAL AGAIN PAYS EXTRA

National Steel Corp., Pittsburgh, has declared the regular quarterly dividend of 25 cents per share and an extra dividend of 12½ cents per share on the common stock, both payable Oct. 31 to Oct. 24 record on each of 2,155,777 outstanding shares.

INTERLAKE HOLDS POSITION

Interlake Iron Corp., Chicago, shows loss of $259,493 in the third quarter, against $345,221 in the second quarter and $344,720 a year ago. For 9 months the Interlake showing is an indicated deficit of $674,266; a year ago it was $635,261.

ACME IMPROVES SHOWING

Acme Steel Co., Chicago, and subsidiaries report for the third quarter net income of $384,479, against $333,348 in the preceding quarter and net loss of $13,846 in the corresponding 1934 period. Net for nine months was $1,319,817, compared with $867,532 a year ago.

CUTLER-HAMMER SHIPS MORE

Cutler-Hammer Inc., Milwaukee, had net shipments during the third quarter of $2,018,464, compared with

KIDD

DRILL ROD
COLD DRAWN SHAPES

Give us the opportunity to demonstrate that accurate drawing, smooth defect-free finish, expert heat treatment and careful inspection are "built in" to any and every Kidd drawn product, standard or special.

37 Years of Experience!

Ask for the decimal equivalent chart.

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$1,794,948 in the June quarter and $1,141,642 in the corresponding 1934 period. Shipments for nine months this year totaled $3,371,522, against $2,814,906 a year ago.

HANNA 9-MONTH NET IS UP

M. A. Hanna Co., Cleveland, net for third quarter was $402,392, against $526,504 in the second quarter and $425,000 in the third quarter of 1934. For 9 months, the Hanna net is $1,351,214, compared with $1,131,050 a year ago.

TO WEIGH WICKWIRE OFFER

Hearings on reorganization of the Wickwire-Spencer Steel Co. will be resumed Oct. 22, in the federal court in Buffalo. At that time the offer of D. Shatzkin Loewi Corp., New York, of $5,700,000 for the outright purchase of the company is expected to come up for consideration. This offer was made during the recent hearings before Federal Judge John Knight in New York. The D. Shatzkin Loewi Corp. is controlled by Shatzkin Loewi & Co., members of the New York Stock Exchange.

Mirrors of Motordom

(Continued from Page 24)

especially on a new car on the street, attract more attention than the printed word.

Then, after the 70 per cent are on the street, the finishing departments will get orders to turn around and return to the old ratio: 70 per cent dark blues and blacks; 30 per cent light colors. Chevrolet began a new radio program last Saturday night.

Incidentally, Chevrolet is not conceding to Ford for 1936. The company is now geared to make 100,000 cars monthly, or 1,000,000 models in 1936. It was stretching a good thing when Chevrolet went just over 100,000 per month as it did several months this year; now with Saginaw, Baltimore, Indianapolis and Tarrytown, N. Y., ready it can do 100,000 jobs each month with comfort.

Chevrolet has a well-intrenched sales point for 1936 in economy and distinctive styling, and is not alarmed over the 1,600,000-car 1935 production Ford will have had by November, nor the boast that 1936 is to be a repeater.

For one thing, Chevrolet is counting on its Standard series to improve. It sold 240,000 of these jobs in 1935 and visualizes a proportionately larger demand along with the Masters.

Last of the "big little three"—Plymouth—was described in this department in some detail in the issue of Oct. 7. Last week Plymouth claimed to have orders on hand for 52,000 jobs, has begun issuing "teaser" pictures of the new car, seems proud of its new front end, and will make a big thing of the "safe vision" headlamp feature in 1936.

Price—always the big "if"—likely will be withheld until Nov. 2 and thereabouts, excepting such as Buick, Cadillac, and Olds. The automobile industry likes to talk about cut prices, but the modest cuts made in the $700-800 car bracket indicate that other cars at the same range will have just about the same tag on as in 1935.

All in all, it's a moderate bill the automobile industry has to pay this year for changes. Not nearly so much as in previous years was spent on tools and dies. So little, in fact, that the industry has come in for its share of criticism for huddling together and standing pat.

Strategically, however, the industry is well off. For, looking ahead, it can easily come into the spring of 1936 and if need be use the hypodermic needle by making another just such crop of "radiator grille" changes.

Pontiac, touched briefly on in this column a week ago, has the following additional changes this year: Doors are swung from front to rear; like Olds, the torpedo-shaped front lamps are mounted on horizontal

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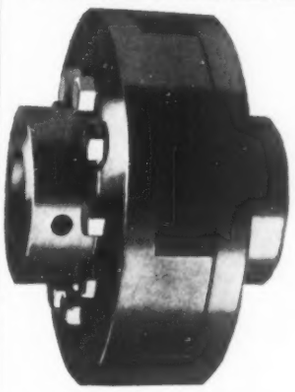

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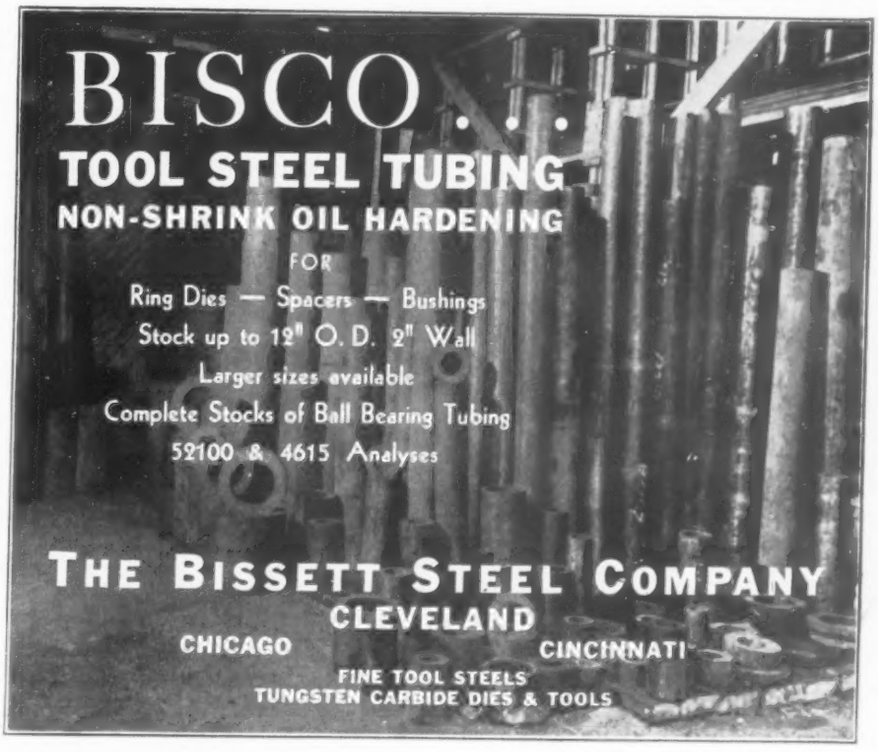

struts, three quarters of the way up the radiator shell; running boards eliminate the outer steel band; wire wheels, with which the first 1935 Pontiacs were equipped, have been dropped entirely, and so have the parking lights which had been mounted on the crest of the front fenders.

The Pontiac six engine is now completely water-jacketed; the bore of the straight eight has been increased 1/16-inch and now is 3¼-inch. Stroke of 3½-inch is the same, but piston displacement is obviously slightly more than last year's 223.4 cubic inches. Compression ratio in both six and eight remains 6.2 to 1.

Pontiac was publicly announced Oct. 19 with the tag of a "100,000-mile car" (something new for a motor maker to distribute propaganda that models shouldn't be changed every year), expects to have 12,000 in the field by this week and 48,000 out by Jan. 1.

The new Lincoln, which Detroit now hears will be called "Lincoln Zephyr," is gathering a reputation for radical streamlining. The running board is understood to be only several inches wide, as passengers are expected to step directly into the car. An average height man will be able to look over the top.

It is reported that two models will be offered—a 2-door close-coupled sedan and a standard 4-door sedan. Wheelbase will be 121 inches. The engine is a V-12, with acceleration and top speed exceeding anything on today's market. Many parts are interchangeable with the Ford V-8. The gas tank, for one item, is identical. Total weight is 3500 pounds.

This "Lincoln Zephyr" is expected to be competitive with the low-price Packard, delivering at about $1200 in most cities.

Equipment

Chicago—Machine tool sales have improved moderately compared with September, when the placing of business was retarded by the Cleveland exposition, but business still is below the July-August rate. Prospects are regarded as more favorable, however, in view of the number of inquiries and proposed purchases now pending. Large lists are few, inquiries generally being made up of only a few individual items. Demand for small tools has shown little change recently and compares favorably with the best previous rate so far this year. While no additional inquiries have appeared for steel mill rolling equipment, considerable activity will be involved in installations already purchased or pending. Repairs to furnace equipment of steelworks continue fairly active as additional blast furnaces are being lighted. One of the latest relining jobs is at the Zenith furnaces, Duluth.

Pittsburgh—Carnegie-Illinois Steel Corp. is now receiving and tabulating bids on the following work in connection with the construction of its continuous shear plate mill at Homestead, Pa.: Electric cranes, reheating furnaces, furnace tables, plate levelers, gages, shears, control equipment, mills, mill tables, main motor drives, charging and discharging machinery. Design of the building is about 60 per cent complete and erection of the mill building is to be started about Jan. 15 and to be completed by June 1, 1936. Last week it was announced that 12 overhead cranes with capacity ranging from 10 to 100 tons will be purchased, about 8000 lineal feet of standard-gage tracks, 600 tons of pipe and fittings, 400 tons of reinforcing materials, and 15,000 tons of castings and forgings, as well as motors ranging from 2½ horsepower to 7000 horsepower, giving a total of 45,000 horsepower.

Construction and Enterprise

Indiana

CLAY CITY, IND. — Town board has plans prepared for a waterworks and distribution system, including deep well, electric turbine type pumping unit, 100-foot elevated tank, costing $60,000. PWA funds allotted. O. Jenkins, Brazil, Ind., engineer.

COLUMBUS, IND. — Reeves Pulley Co., manufacturer of variable speed control equipment, recently completed the third addition to its office and factory space. This expansion includes an area of 50 x 70 feet added to the main machine shop, about 2000 square feet added to the facilities of the assembly department, and 2500 square feet of additional office space.

DUBLIN, IND. — Town board, A. E. Simpson clerk, is preparing plans and will soon take bids for a waterworks system, including electric turbine type pumping unit, elevated tank, etc., costing about $40,000.

INDIANAPOLIS — Cooley Electric Furnace Co., manufacturer of electric furnaces and various types of electric heating apparatus, has expanded its plant facilities by moving to a new location at 1411 East Twentieth street.

NEW MARKET, IND. — Town board will soon take bids for construction of a waterworks system, including a 150-gallon per minute deep well turbine pump and elevated tank 90 feet high. Municipal Engineering Co., P. O. box 112, Plainfield, Ind., engineer. Estimated cost $40,000.

Ohio

COLUMBUS, O. — Ebco Mfg. Co., 401 West Town street, A. R. Benua general manager, recently organized to take over the D. A. Ebinger Sanitary Mfg. Co.'s plant, plans to erect a gray iron jobbing foundry. Adam E. Fisher will have charge of rebuilding the Ebco

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foundry and equipping it with modern machinery and appliances for the production of gray iron castings.

DAYTON, O. — Lowe Bros., paint manufacturer, will remodel its building on East Third street and Wayne avenue, at an estimated cost of $100,000.

FRANKLIN, O. — Franklin Board & Paper Co. is considering extensions and improvements to its boiler plant, including installation of additional equipment, at an approximate cost of $25,000.

NORWOOD, O. — Cincinnati Chemical Works Inc., Evanson station, Cincinnati, has engaged Tietig & Lee, architects, to prepare plans for a 2-story addition to its plant here.

SPRINGFIELD, O. — Springfield Brewing Co., care of Konrad Keil, 1215 Windsor drive, Dayton, O., consulting engineer, plans installation of boilers and accessories, and other power equipment, coolers, tanks, etc., in new local brewery. The company has taken over plant of Home City Brewing Co. which it will modernize and equip. Cost estimated at $80,000.

TOLEDO, O. — Schultz Die Casting Co. has started construction of a new unit, 60 x 140 feet. This enlargement was necessitated by an increased demand for die castings. Cost is estimated at $15,000.

Illinois

CHICAGO—Ajax Plating Works Inc., 2847 South State street, has been incorporated by Nathan Rosenber, Dewey Prosperi and Anne Raymond, to deal in machinery and appliances. Correspondent: Samuel G. Routbord, 221 North LaSalle street.

CHICAGO — Air Conditioning Equipment Co., 10 North Clark street, has been incorporated by David L. Jennings, M. J. Sabath and John A. Kleinhuizen, to manufacture accessories pertaining to air conditioning machinery. Correspondent: M. J. Sabath, Sabath & Edelman, 10 North Clark street.

CHICAGO — Harris Boiler & Welding Co., 554 Polk street, has been incorporated to manufacture, install and repair steam and water boilers, tanks, etc., by Ralph Reuben Anderson, Edward E. Maxfield and Albert Lawrence. Correspondent: Charles R. Casler, 39 South LaSalle street.

CHICAGO — Metal Rolling & Stamping Co., 120 South LaSalle street, has been incorporated by J. Robert Raleigh, John H. McBride and Arthur W. Sprague, to engage in the rolling, processing, and fabricating of nonferrous metals. Tenney, Harding, Sherman & Rogers, 120 South LaSalle street, correspondent.

Michigan

DETROIT—Hydraulic Detroit Pump Corp., 284 Walker street, has been formed with $30,000 capital to deal in machinery, by Augustus Galorneau, Detroit.

MUSKEGON, MICH.—Service Machine Works Inc., 1922 Peck street, has been incorporated with $6000 capital to deal in machinery, by G. E. Dake, Muskegon, Mich.

Connecticut

NEW HAVEN, CONN. — Hull Brewing Co., West street, will soon take bids for a 2-story, 72 x 112-foot, steel brewery addition, costing about $28,000.

NORWALK, CONN. — City is contemplating erection of waterworks, including pumping unit and storage facilities. Estimated cost $218,000. PWA grant of $98,000 has been allotted. P. James, city hall, engineer.

WALLINGFORD, CONN. — Benjamin Slade, New Haven, Conn., and Murray Crossman, Ansonia, Conn., have purchased the Essex Wire Corp. The plant, which has been idle for some time, will be reopened.

Massachusetts

BERNARDSTOWN, MASS. — Town is considering erection of waterworks supply system. Weston & Sampson, 14 Beacon street, Boston, engineers.

BOSTON — Metropolitan Coal Co., 20 Exchange place, is planning to erect a new addition to its coal storage and distributing plant at Chelsea, Mass., with installation of screening, conveying, loading and other mechanical equipment. Cost estimated at $175,000.

BOSTON — State hospital depart-

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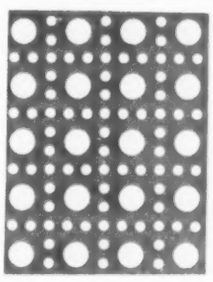

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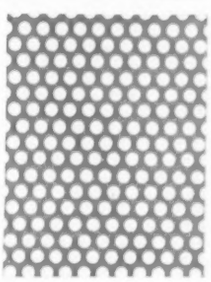

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56 YEARS . . . 171 York Street ROCHESTER, N. Y. IN BUSINESS

ment, State House, is contemplating improvements to the power house at the state hospital at Danvers, Mass., including installation of new boiler units and other equipment. Cost estimated at $150,000. Similar improvements will be made in the power house at the state hospital at Taunton, Mass., cost of which is estimated at $120,000. Financing is being arranged through federal aid.

LYNN, MASS. — Lynn Gas & Electric Co., 90 Exchange street, is preparing plans for a 1-story steel boiler house, costing approximately $40,000.

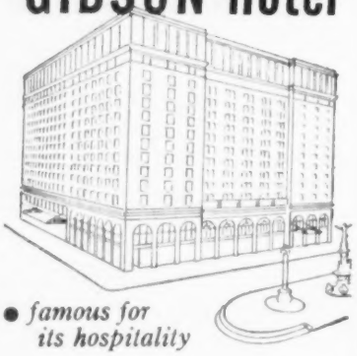
SWANSEA, MASS. — Town, H. H. Read Jr., chairman, fire and water commission, has plans completed for a waterworks system, costing $290,000. PWA project.

WORCESTER, MASS. — White Co., 30 Rockefeller Plaza, New York, is considering purchase of a building here, which it will alter and equip. Cost estimated above $30,000.

FAMOUS LANDMARKS

Athens has the Acropolis

Cincinnati has the GIBSON Hotel



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Maine

SKOWHEGAN, ME.—State department of public institutions, state house, Augusta, Me., is completing plans for erection of a steam power house at the state reformatory for women. Project includes installation of mechanical laundry unit. Cost $65,000. A. J. Thayer Co., 2 Spring street extension, Auburn, Me., consulting engineer.

New York

BROOKLYN, N. Y. — Department of water, gas and electricity, Municipal building, New York, has plans for a 1-story pumping station, costing approximately $500,000.

BUFFALO — United States Gypsum Co. plans to spend approximately $400,000 in modernizing its various plants.

BUFFALO — Bell Aircraft Corp., 250 Elmwood avenue, organized recently by Lawrence D. Bell and associates, will install motors, conveyors, hoists and other power equipment in its new aircraft plant. Estimated cost $75,000.

NEW YORK — Hudson Marine Service Inc. has been incorporated with 200 shares of no par value, to deal in machinery. Papers filed by Joseph Youngwood, 11 East Forty-fourth street.

NEW YORK — Standard-yne Burner Corp. has been incorporated with $5000 capital to manufacture boilers and furnaces. Papers filed by H. D. Levy, 26 Court street, Brooklyn, N. Y.

New Jersey

BAYONNE, N. J. — City has plans for constructing a marine terminal, including docks, warehouse, railroad, ferry, slip, etc., costing $5,454,545. PWA grant of $3,000,000 has been allotted. W. Clarkson, city engineer.

Pennsylvania

PITTSBURGH—Screw Machine Specialty Co. has purchased property at 5637 Butler street, formerly occupied by the Somerville Iron & Bronze Co., for expansion purposes.

Alabama

MOBILE, ALA. — Alabama State Docks, S. P. Gaillard Jr. attorney, has allotment of $880,000 approved by President Roosevelt for constructing wharf and cold storage plant. Refrigeration equipment, and three electrically-operated conveyors will be installed.

Maryland

BALTIMORE — Southern States Iron Roofing Co., Harry Fulenwider president, Savannah, Ga., is erecting an addition for storage purposes and is installing equipment in its plant here. F. O. Wahlstrom is manager of the plant.

Kentucky

FRANKFORT, KY. — National Distillers Product Co. will rehabilitate the distillery it has acquired here.

MAYSVILLE, KY.—H. E. Pogue Distillery Co., Cincinnati, will build a water intake and pump house on the Ohio river near here.

NEWPORT, KY. — Mayer Interests, formerly connected with the Wathen Distillery at Lebanon, Ky., have purchased a site here and will erect a $150,000 plant.

Georgia

ATLANTA, GA. — Stein Metals Corp., 301 Decatur street, has plans by E. C. Seiz, architect, 119 Lucke street, for remodeling its present building and erecting a new unit.

BRUNSWICK, GA. — City, J. F. Ahern consulting engineer, 2355 Post street, Jacksonville, Fla., has been allotted 45 per cent grant by PWA for street lighting system and power plant. Bids probably will be invited about Dec. 1.

Florida

PALMETTO, FLA. — Palmetto Canning Co. is planning to remodel and install canning equipment in the Snyder building, which it recently acquired.

PENSACOLA, FLA. — A. L. Reinschmidt president, Pensacola Cooperage Co., Tarragona and DeSoto streets, is planning to rebuild its burned finishing plant either on the original site or nearer the main plant at Goulding, Fla.

TAVARES, FLA. — John Barnes Co. Inc., Plant City, Fla., is considering installation of electric power equipment, conveyors, loaders, etc., in proposed new branch plant here, costing close to $65,000.

North Carolina

ASHEVILLE, N. C. — Chickasaw Industries Inc., Memphis, Tenn., has leased the site of the old Asheville Mfg. Co., and plans to establish a cooperage plant here for the manufacture of barrel staves.

BURGAW, N. C. — Town, Mrs. E. G. Paddison clerk, receives bids Oct. 31 for construction and erection of a 75,000-gallon steel tank on 100-foot steel tower.

Tennessee

KNOXVILLE, TENN. — Director of purchases, Tennessee Valley Authority, will take bids Oct. 30 for one 75-ton traveling crane for the Wheeler power plant project.

West Virginia

CHARLESTON, W. VA. — Virginia Steel Corp., temporarily located at 1646 Fourth avenue, has purchased a site on Brooks street for the erection of an office building, plant and warehouse. The plant will be equipped for straight line steel production. F. A. Prince is president.

Missouri

BETHANY, MO. — City, K. M. Wood city engineer, will call for bids as soon as PWA has approved $41,000 waterworks project, including erection of two pump houses, with electric centrifugal pumps.

KIRKWOOD, MO. — City, Joseph N. Wilson city engineer, is having plans prepared for an activated sludge disposal plant; will install primary and

(*Please turn to page* 96)

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159—Malleable
2,860—Nonferrous (of which 1,356 are exclusive nonferrous foundries and 1,504 nonferrous departments of other foundries)
86—Permanent Mold
92—Die Casting
3,356—Pattern Shops
3,388—Machine Shops

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Buffalo, New York Detroit, Mich.
New York Philadelphia Boston

(*Concluded from page 94*)

secondary tanks, generator, digestor pumps and motors. Estimated cost $62,500. Date of opening bids not decided.

PARMA, MO. — City will soon take bids for improvements to waterworks and distribution system, including deep well, pump house, pumping equipment, and 75,000-gallon steel tank on tower. Cost $38,000.

SPRINGFIELD, MO. — Producers Creamery Co. plans to spend $200,000 for building expansions, doubling its present capacity. A cold storage system and milk processing machinery will be installed.

ST. LOUIS — Modern Engineering Co., 3411 Pine street, manufacturer of acetylene torches and welding equipment, has acquired buildings on the northwest corner of Channing avenue and Pine street which it will remodel and equip to expand its facilities.

Texas

DEPORT, TEX. — City, Karl V. Kimball, city secretary, plans $65,000 improvements to waterworks, including installation of filtration and pumping plant, elevated tank and tower.

HOUSTON, TEX.—Deep Water Oil Refining recently sustained severe damage by fire to its plant here.

QUEMADO, TEX. — City, C. B. Carey mayor, plans to construct a waterworks system, including installation of pumping equipment, surface and elevated tanks, distribution system. Estimated cost $45,000. C. H. Mullins, engineer, Carrizo Springs, Tex.

Wisconsin

MILWAUKEE—Cutler-Hammer Inc. has broken ground for erection of a new enameling shop at its West Orchard street branch plant.

MILWAUKEE—Department of public works has accepted bid of Allis-Chalmers Mfg. Co. to furnish pumping equipment, motors, etc., for the new water filtration plant, at $98,571.

MILWAUKEE—John S. Franco has leased factory space at 2021 South Fifty-fourth street, in West Allis, for the production of tractors.

OWEN, WIS. — Northern States Power Co., Eau Claire, Wis., plans early rebuilding of pump and power station recently damaged by fire. Machinery and equipment will be purchased.

ROTHSCHILD, WIS. — Marathon Chemical Co. will install electric power equipment in the new 1 and 2-story factory additions it is erecting at a cost of about $65,000. (Noted Sept. 16).

SHEBOYGAN, WIS. — City council has authorized a bond issue of $750,000 to meet federal loan and grant of $592,962 for construction of municipal sewage disposal plant and system. Jerry Donahue is consulting engineer.

SOUTH MILWAUKEE—Line Material Co. is completing erection of new transformer shop, 60 x 100 feet. W. D. Kyle is president.

Minnesota

MINNEAPOLIS — Superior Products Mfg. Co., 1825 Marshall street, sustained severe damage by fire, which started in the foundry room. Considerable equipment was damaged.

Kansas

ELLIS, KANS. — Common council has plans for a new municipal electric light and power plant, costing about $80,000. Financing is being carried out through federal aid.

Idaho

BOISE, IDAHO—Boise Cold Storage Co. Ltd. sustained severe fire damage, including considerable loss to machinery.

Arizona

PHOENIX, ARIZ.—H. M. Crumbaugh, 530 West Jefferson street, is contemplating erection of a dry ice plant to cost $100,000. A company is being organized to build and operate the plant.

Pacific Coast

EL MONTE, CALIF. — L & S Rod & Reel Co., 225 Kauffman street, will build a new factory addition to its plant here. Wrapping machines, lathes, drills, punch presses, and other equipment used for the making of fishing equipment will be installed. Tom Lester is proprietor. Cost estimated at $10,000.

LOS ANGELES — Republic Supply Co., 2122 East Seventh street, has awarded contract to May & Grimwood, 520 East Eighth street, for construction of a 1-story machine shop building.

LOS ANGELES—Western Candy Box Co. is building an addition to its plant at 1243 East Sixty-third street, at a cost, with equipment, of $25,000. W. R. Hageman, Tenth street and Western avenue, Los Angeles, is architect.

LOS ANGELES—Architect James H Garrott, 2111 East Fourteenth street, has applied for a building permit to erect a 1-story sheet metal shop at 1311 West Florence street for Malcolm Telloian, owner.

LOS ANGELES — Los Angeles board of education has approved working drawings for two new shop buildings to be built at Venice high school, 13000 Venice boulevard. Cost estimated at $75,000. John C. Austin and Frederic M. Ashley, 608 Chamber of Commerce building, architects.

SAN FRANCISCO—Miller & Pflueger, 580 Market street, are preparing plans for the construction of a machine shop at George Washington high school at Thirty-second avenue and Geary boulevard.

SAN FRANCISCO—Rough Rider Mfg. Co., Nathan Rothman, proprietor, 17 Twelfth street, plans construction of a factory building in Napa, Calif., costing $50,000. W. W. Hanscom, 848 Clayton street, is engineer.

SANTA MONICA, CALIF. — Douglas Aircraft Co., 3000 Ocean Park boulevard, is planning erection of three new units to its present factory, cost of which will exceed $28,000. L. B. Norman, 103 Seventeenth street, is in charge of construction.

KLAMATH FALLS, OREG.—PWA funds totaling $63,636 have been made available for construction of a hydroelectric plant.

SALEM, OREG.—A. J. Anderson has been awarded contract to build for the state a frame warehouse and highway department shops.

CENTRALIA, WASH. — Centralia Foundry & Machine Co. Inc. has been incorporated with $10,000 capital, by J. C. Hampe and associates.

SEATTLE — Preferred Equipment Co., 514 Denny way, has been organized by A. C. Wright and associates, to deal in automatic electric control equipment.

SEATTLE — Pacific Ferro-Alloys Corp., 700 Insurance building, has been organized by E. C. Moffitt and associates, to engage in general smelting and refining of ores.

SEATTLE—Seattle Gas Co. has plans for remodeling its retort house, construction of offices, testing laboratory, and shops.

SEATTLE—Colby Steel & Engineering Co., M. R. Colby, president, is preparing plans for a $365,000 deep sea terminal and warehouse at Dalles, Oreg. General supervision is in the hands of Col. B. C. Allin, manager of the Port of Stockton, Calif. Bids will be invited in November.

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